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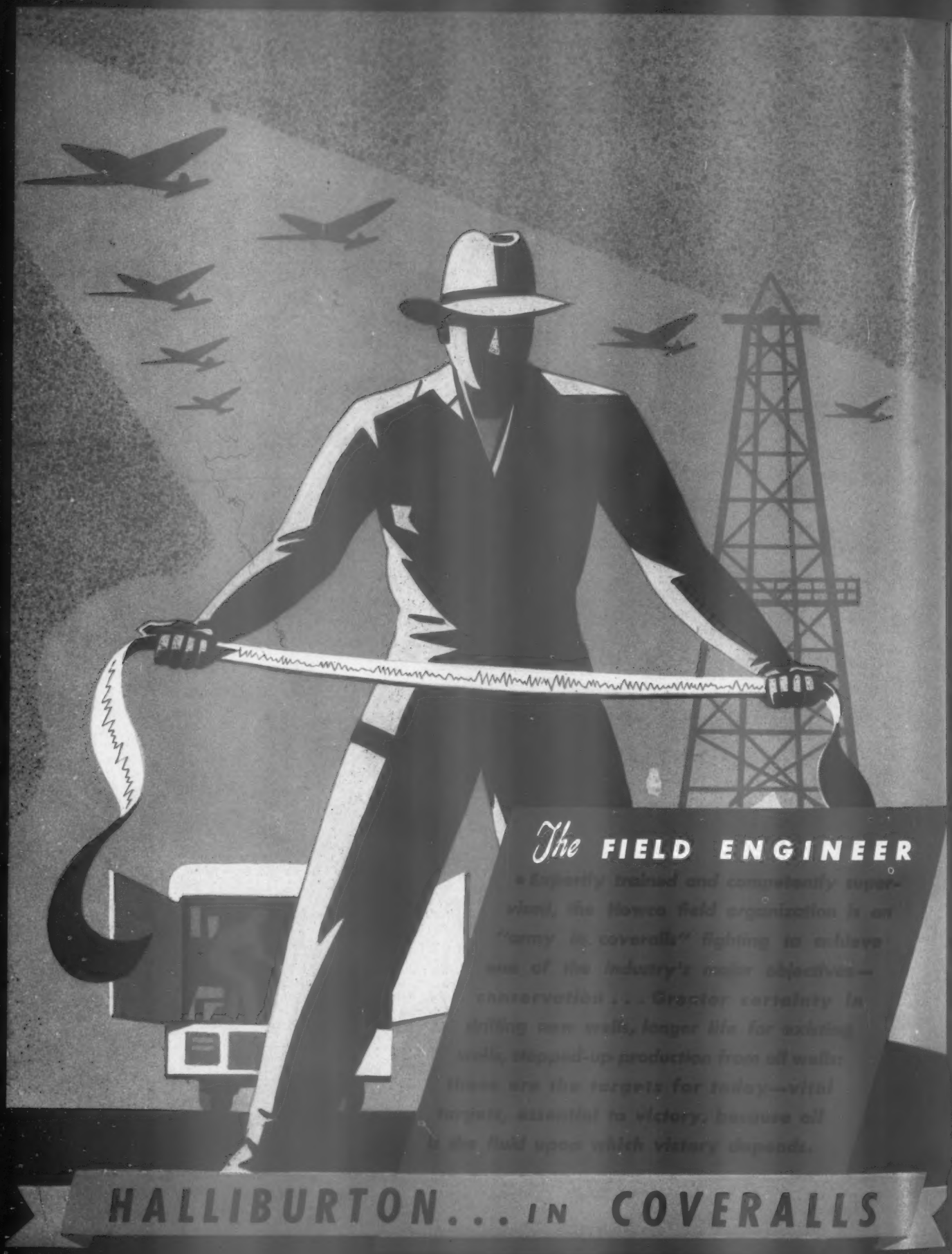

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Trends

Crude-Oil Production
By States — Page 66

CRUDE PRODUCTION 3,912,170 bbl. daily average—down 30,730 bbl. One year ago 3,844,150 bbl.

CRUDE STOCKS 238,417,000 bbl. as of March 20—up 1,762,000 bbl. One year ago 261,724,000 bbl.

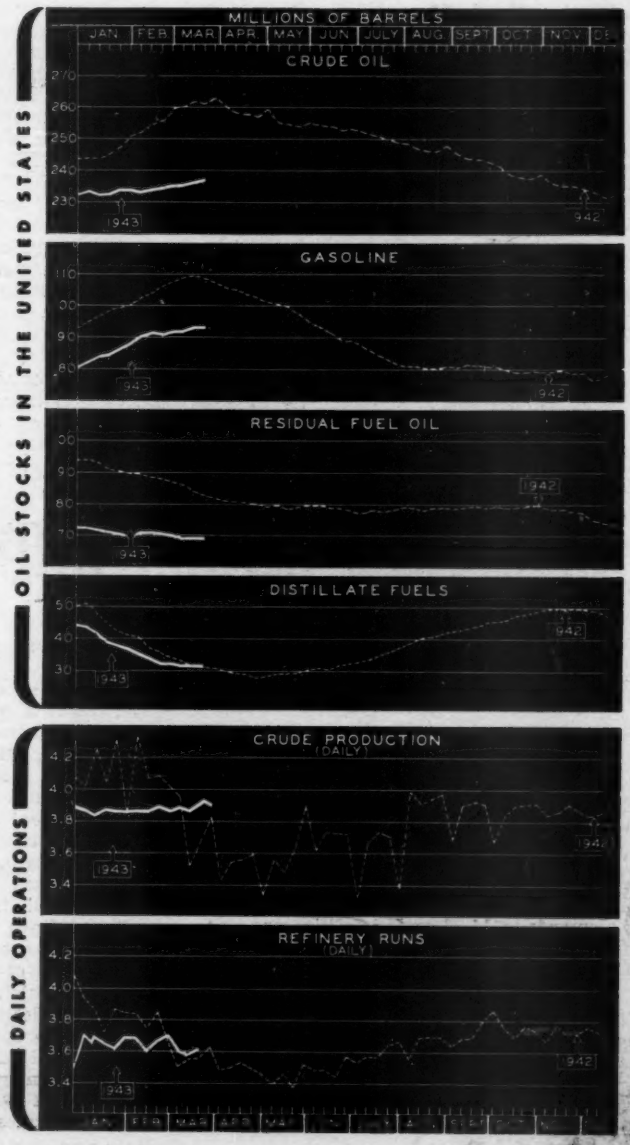
GASOLINE STOCKS* 94,159,000 bbl. as of March 20—down 2,000 bbl. One year ago 107,926,000 bbl.

RESIDUAL FUEL-OIL STOCKS 68,178,000 bbl. as of March 20—down 65,000. One year ago 83,394,000 bbl.

GAS OIL AND DISTILLATES† 31,724,000 bbl. as of March 20—down 905,000. One year ago 31,337,000.

REFINERY RUNS 3,618,000 bbl. daily week ended March 20—up 39,000. One year ago 3,579,000 bbl.

*Revised, last week 94,161,000. †32,629,000.



AROUND the hotel lobbies last week at the Kansas City meeting of the Western Petroleum Refiners Association there were frequent discussions as to how refiners and marketers in the Mid-Continent and in the Middle West will take care of the summer agricultural demands for gasoline. Normally most refiners are prepared to supply their farm customers during this period of maximum requirements from storage accumulated earlier in the year. These inventories enable them to make deliveries for several weeks at rates which are 50 to 200 per cent in excess of their current gasoline production. This year many refiners have only a small fraction of their usual storage. Unless conditions change over the next few weeks the storage supplies for a large agricultural area within the interior states will have to come from other sources. Observers who are familiar with conditions believe this situation is so critical in some sections that it should receive special consideration at Washington immediately.

CHECKS made by the smaller refiners indicate that the summer demand for gasoline from farms will be greater than ever before. While there is some rationing of the family car on the farm, ration boards generally have pursued a liberal policy in making petroleum products available for all farm uses. A large part of the summer farm demand for gasoline comes from more than 2 million tractors and other gasoline-powered farm facilities. Thousands of tank trucks, operating 24 hours daily from refineries and bulk terminals, are used in supplying the summer demands. It is explained that tractor fuels and other distillates which are also scarce, do not offer a substitute for gasoline because most tractor engines can only operate with gasoline.

NO general solution is offered to this problem which will vary somewhat in detail from plant to plant. In the Mid-Continent and in the Middle West there is little hope of refiners being able to expand their crude runs to stills in order to increase the quantities of gasoline in storage. This is due to the fact that the crude oil is not available. Substantial changes in the present movement of gasoline from plants to consumers east of the Rocky Mountain states is suggested by one operator who predicts that unless this is done, gasoline consumers in cities and towns in the affected areas will see substantial reductions in the value of their gasoline ration coupons starting in the near future.

Ceiling Prices Raised on Heavy California Crude And Residual Fuel Oil

by Henry D. Ralph

WASHINGTON, D. C.—An increase in the price of California heavy crude oil and of residual fuel and asphalt made from it was granted by the Office of Price Administration, effective March 26, coupled with a warning on refinery profits which suggests a precedent which may be followed in later oil-price actions.

Although prices for domestic heating oil and lighter products were not altered, OPA stated that the new price for heavy products will result in "a substantial increased income to California refiners" and announced that the prices of lighter products probably would be reduced in order to offset this.

If this action may be taken as a precedent it would indicate that OPA is definitely opposed to any over-all increases in crude prices, and that any increases will be highly selective, related to conditions in particular fields, and accompanied by both upward and downward revisions in product prices.

The California crude schedule sets specific prices for different gravities of crude in designated fields only.

The delay in issuing the new price schedule is also significant. Last August, the Petroleum Administration for War suggested to OPA that demands for California heavy crude warranted an increased price, and a study was begun. PAW recommended an increase on January 30 but it took OPA nearly 2 months to act on this recommendation. The delay presumably was due to the desire of OPA to study the effect of an increase on refinery revenue and to work out a new schedule of product prices which would avoid important increases in the general average of petroleum markets.

Pegged to 15 Gravity

OPA's action established a new schedule of maximum prices by increasing the ceiling on crude of 15 A.P.I. gravity and below by 25 cents per barrel. The maximum price thus obtained in a given field also applies to all gravities of crude above 15° for which prevailing maximum prices are below the adjusted ceiling price on 15-gravity crude.

To illustrate: The old maximum price of 15-gravity crude produced in the Signal Hill fields was 68 cents per barrel. With 25 cents added, the new ceiling price will be 93 cents. But the existing price for 17-gravity crude is only 76 cents per barrel. Therefore, the maximum price for crudes of 17° and other gravities for which existing prices are under 93 cents receive a new ceiling in that field of 93 cents a barrel.

The increase of 25 cents per barrel in the ceiling price for heavy fuel oils applies throughout the states of California, Washington and Oregon.

Asphalt Price Advanced

Asphalt price ceilings were also increased with crude and fuel in the Pacific Coast area. The crude increase of 25 cents per barrel was translated into an advance of $1.40 per ton in asphalt-price ceilings on the basis of 42 gal. per barrel and an average of approximately 240 gal. per ton.

The increase, explained Ralph K. Davies, acting petroleum administrator, is expected to arrest the monthly quota decline caused by decreasing productive capacity of certain California fields. The need for greater amounts of the types of crude and fuel oil covered by the elevated price ceilings is heightened by demands of the armed forces in the Pacific theater.

Amendment 87 to Revised Price Schedule 88 sets maximum prices at

(Continued on Page 26)

NEW ORDER SUPERSEDES M-68

Pertinent extracts from text of the new order, PAO 11, appear on pages 24 and 25 of this issue.

WASHINGTON, D. C.—Conservation Order M-68 has been revoked effective March 30 and superseded by Petroleum Administrative Order 11 and a series of supplements issued by PAW.

New order consolidates several supplements to M-68 and simplifies procedure considerably. Intent is to outline general conditions under which authority to acquire and use materials in production is granted automatically with minimum of paper work.

Exceptions granted and applications pending under the old order are not disturbed.

The new order imposes no restrictions on use of material for wildcat wells.

Important high spots of PAO 11 include: Definition of maintenance and repair is recast and made to cover capital additions up to $500, thus simplifying accounting practices; pumping equipment may not be installed in flowing wells except where incapable of meeting allowables; definition of condensate field is dropped and specific fields are listed where exception is required for all drilling; exploratory well redefined to exclude all wells in gas or condensate proven areas regardless of distance from other wells; provisions liberalized for plugging back or deepening wells conforming to 40-acre spacing; gathering systems not duplicating existing facilities may be constructed up to cost of $2,500; all gas wells require exceptions but Supplemental Order 1 gives certain blanket exceptions in Appalachian region and parts of Oklahoma, Kansas and Missouri and old order relating to Hugoton field is revoked; M-68-5 which gave more liberal spacing provisions in Illinois and Indiana is revoked and these fields must come in for special exceptions; in sectionalized areas the drilling unit is redefined so that it must consist of a quarter-quarter section of at least 35 acres.

Secondary-recovery operations are no longer automatically excepted but Supplementary Order 2 provides exceptions for eastern fields. Paper work is simplified by use of PAW Forms 3 and 4 in place of old PD 214 A, B, and C. Supplementary Order 3 provides for reworking old wells in the Smackover field. Supplementary Order 4 temporarily reissues M-68-3 relating to heavy oil in California.

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THIS WEEK

MARKETS—OPA permits rise of heavy-crude ceiling in California. . . . Residual-fuel and asphalt pegged prices raised simultaneously. . . . Purchasers hesitate to post higher ceilings, obviously wary of OPA's extraneous warning that lighter products might have to come down accordingly. . . . ¶Subcommittee, representing national crude-oil-requirements group, to place conclusions at door step of White House. . . . Decision reached that elevated ceiling only way of averting crude shortage. . . . ¶Product prices steady in most sections, except gasoline in California, which is weak, because of shrinking outlets. . . .

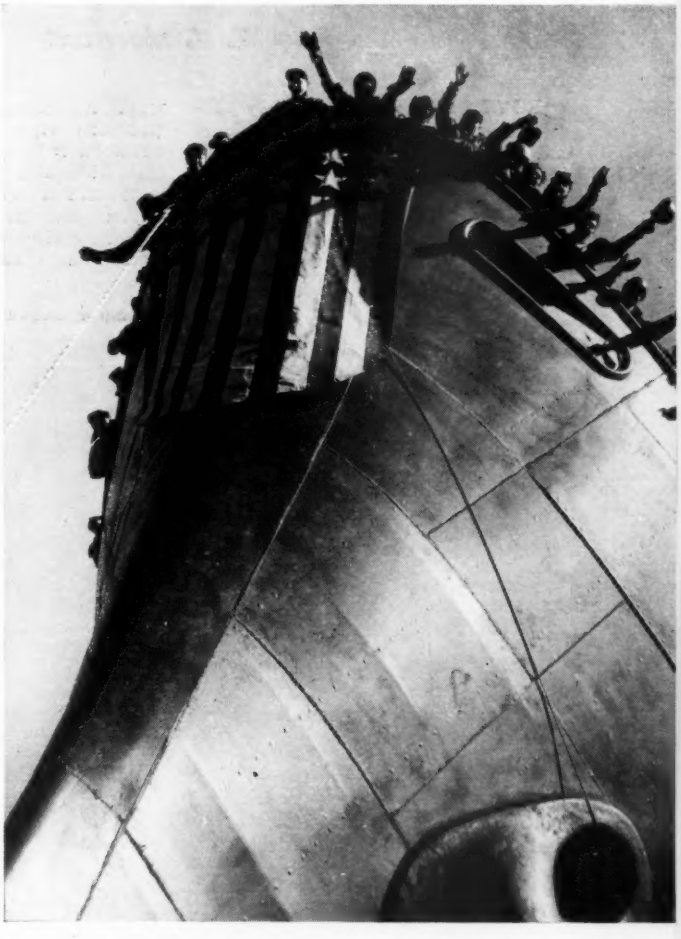
REFINING— Additional aviation-gasoline capacity sought on West Coast. . . . PAW interest in more plants east of Rockies confined to those requiring minimum of critical material. . . . ¶War plants—synthetic rubber, aviation gasoline, toluene, etc.—appear capable of exceeding original estimated productivity. . . . ¶Isolated interior refineries sustained by spread of product lines, affording outlet through trunk systems, to major markets. . . . ¶Two independent plants, Cushing Refining & Gasoline Co. and Petroleum Products Refining Co., sold to Cooperatives, in Minnesota and Missouri, respectively. . . .

TRANSPORTATION— Total rail movement, including kerosene in drums to New England, averaged 832,172 bbl. daily last week, off 1,706. . . . ¶New England congresswoman proposes legislation calling for third big-inch line. . . . ¶Resumption of gasoline tank-car shipments into District 1 still rumored, BUT emphasis throughout summer will be on fuel oils, for next winter's demand. . . . ¶Norris City terminal of WEP loading 600 cars daily, still below expectations. . . . All stations now complete, between Longview and Norris City, BUT they can't be used until rail movement is synchronized with pipe-line deliveries. . . . Clearing weather permits acceleration of construction pace on eastern extension, to 4 or 5 miles daily. . . .

EQUIPMENT—Petroleum Administrative Order 11 supersedes M-68 which is revoked, effective March 30. . . . ¶Redistribution program, of PAW, calls for enforced use of inventory materials, before new preference ratings can be assigned. . . . Means virtually nothing in some major items BECAUSE redistribution already has been fully effective. . . . This is in nature of a cleanup, bringing industry's surplus material to absolute minimum. . . . ¶Many essential requirements must now be met entirely from new material, with preference assistance. . . . ¶PAW assigned control over all inventoried equipment, as part of redistribution program. . . .

PRODUCTION—New oil sand found in Katy gas-condensate field, Waller County, Texas. . . . Raises new jurisdictional question between divisions of PAW, similar to one now existing in Arkansas condensate-oil fields. . . . Discovery of oil in gas or condensate field raises complex question over spacing program, handling of wells, completion practices. . . . ¶Michigan output this month may decline to 56,000 bbl. daily average, lowest of year. . . . State officials urge PAW to bestow more authority on district offices, so petitions for exceptions could be ajudicated promptly. . . .

RUBBER— Copolymerization plant, at Baton Rouge, La., one of first started on basis of Baruch recommendations, nearing completion. . . . Butadiene supply will come from Standard of Louisiana plant, recently placed in operation. . . . Work starting on another similar unit, at Lake Charles, La. . . .



Workers cheer as this new tanker, the Texas Co.'s Georgia, slides down the ways at the Sun Shipbuilding & Dry Dock Co. yards at Chester, Pa. This is one of three such tankers launched last week in a space of 16 minutes during ceremonies at which Adm. E. S. Land, Maritime Commission chairman, presented the company with an "M" award. During February, Sun Shipbuilding launched nine tankers, the best record yet attained, in this vital phase of transporting petroleum to the war theaters

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Large Reserve Decline Shown By Allocations to Discovery Year

Since 1938 major discoveries have been few in number and production has increased, causing a decline in reserves amounting to 12½ per cent.

Prior to 1939 there were no deficiencies of discoveries except during a few scattered years, while the deficiency beginning in 1939 has continued for 4 years.

The normal price relationships were disturbed by the flood of flush production between 1930 when East Texas was discovered and 1938 which was the second largest discovery year.

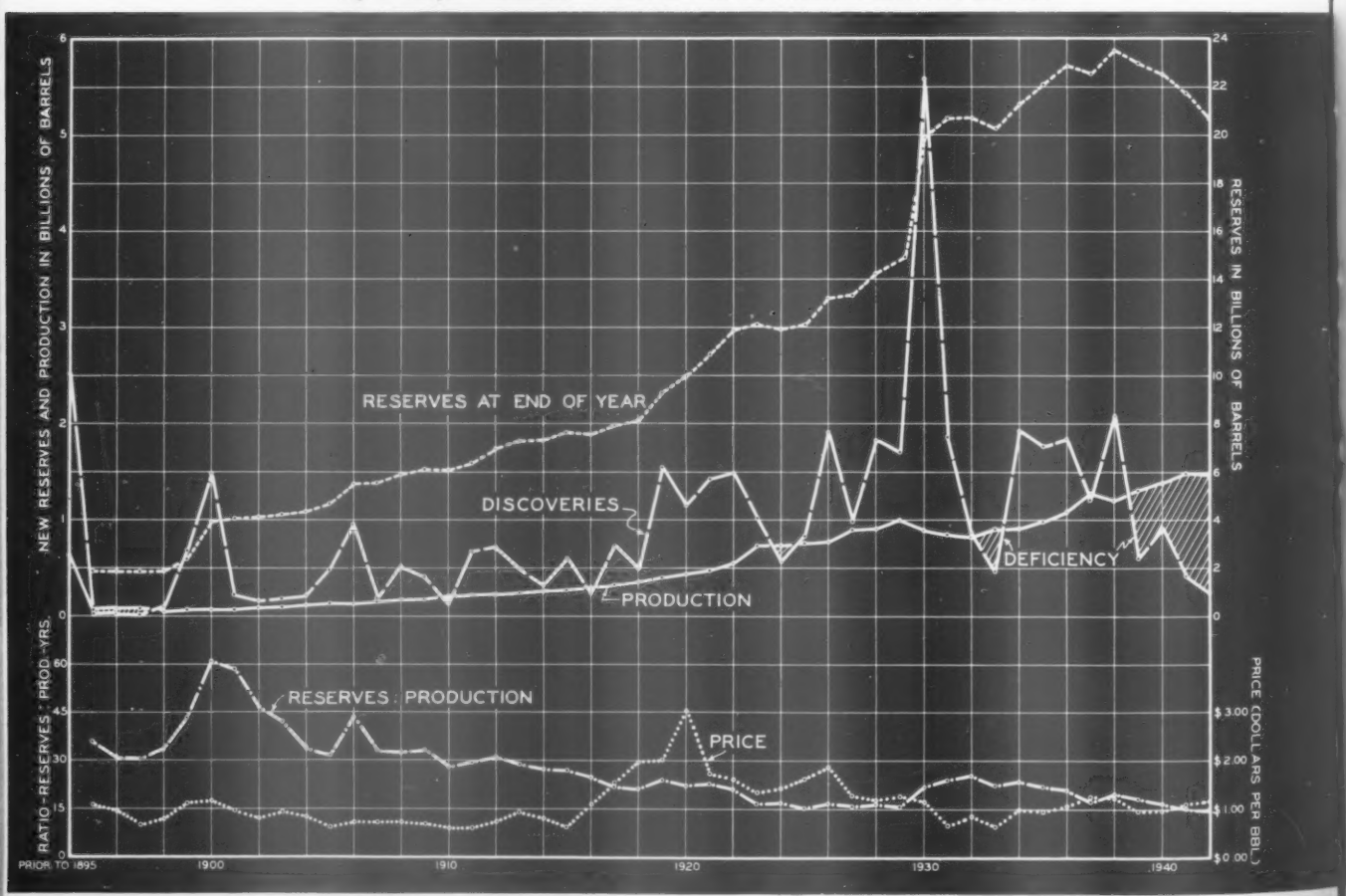
The resulting failure of prices to conform to reserve declines has been intensified by wartime controls.

by W. V. Howard

PROVEN reserves as previously published by The Oil and Gas Journal have been inventories of the estimated amount of recoverable oil known at the end of each calendar year. The estimates may be much less than the total amount actually recoverable from the reservoir and from the different reservoirs on the structure when they are completely developed. It is possible under this method to add large quantities of oil to the nation's estimated reserves during a year in which the amount added by discoveries is actually very small. Last year is an excellent example. In its annual review number, The Journal showed that 1,760,884,000 bbl. had been added to the nation's proven reserves in 1942. Of this, 919,496,000 bbl. were added by revision of estimates of oil in older fields. Extensions to older fields accounted for 515,580,000 bbl. and discoveries of new sands and new fields added only 322,808,000 bbl. Of this, 53,108,000 bbl. are attributed to new pays leaving only 269,700,000 bbl. proven in new fields. This estimate is bound to be revised upward, particularly in such fields as Quitman, but the fact is that at the end of the year discoveries account for less than 20 per cent of the oil removed from all fields by production.

There is much discussion of the practice of allocating all oil in a field to the year in which the field is discovered. This has certain advantages over the inventory method. It may be assumed that before a structure is abandoned, the deep sand possibilities will be explored. It is certain

Fig. 1—Graphic relationship of crude-oil reserves, production, discoveries and price



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that a field will not be abandoned without being fully outlined. Extensions and deep pays, therefore, may be considered as discoveries made in the course of routine activity by the production department. The chief task of the exploration department was completed when the discovery well was brought in. Allocating all of the recoverable oil to the year of discovery, therefore, shows more clearly the trend of discoveries than the inventory method.

The main disadvantage of what might be called the discovery method is that the books never close on a field until that field is abandoned, nor on any year until all of the fields found in that year are abandoned. The reserves at the end of 1895 stand at a very much higher figure today than they did in, say, 1910. These fields include the Bradford-Allegany area whose recoverable reserves were greatly increased by flooding.

Also some fields consist of a number of pools. In Midway-Sunset, for example, new discoveries have been made during the past few years. Production from these discoveries is generally grouped with that of the original field so that, with the exception of the Buena Vista sector, the whole of the recoverable oil known in this field is treated as a 1900 discovery.

Growth by Years

Table 1 shows the quantity of oil discovered in new fields every year since 1895. Much of the oil allocated to the pre-World War 1 period is in fields which have subsequently been grouped, such as the fields in eastern Kansas, eastern Oklahoma, Illinois, etc. The record for these fields is not as accurate as that for later discoveries. However, large additions to discoveries in any one of these early years is normally due to one or more large fields. Of these, Coalinga, Kern River and Midway-Sunset are responsible for the large additions to reserves in 1899 and 1900. The major discoveries of 1905 were in the Nowata district of Oklahoma and the Caddo field in North Louisiana. In 1906, the La Salle anticline in Illinois and Glenn Pool in Oklahoma were found. The major field of 1908 was Salt Creek, Wyoming, of 1909, Buena Vista Hills in California, and of 1911, Electra and Burkburnett in North Texas. All of these added more than a full year's supply of oil to reserves at the current rate of production.

Cushing-Drumright in 1912 and Healdton in 1913, brought Oklahoma back into the picture. Major discoveries made during the first World War included Ventura Avenue in California, El Dorado, Kansas, and a number of Oklahoma fields. The second billion-barrel year, 1919, saw the start of the California flood with Santa Fe Springs, Elk Hills and Richfield. In the following year, Huntington Beach came in with Long Beach and Torrance in 1921. East of the Rockies, the largest discovery during these 3 years was Burbank in Oklahoma. Hutchinson County in the Texas Panhandle and Smackover in Arkansas made 1922 the fourth consecutive billion-barrel year followed by another in 1923 with a large number of fields including Big Lake and Cromwell which started the West Texas and Seminole plays. Yates, Hendrick, McElroy, and Chalk-Settles accounted for nearly two-thirds of the oil discovered in the peak year of 1926 and these were closely followed by the Seminole, Oklahoma City, Hobbs and Eunice fields, and in 1929 by Van and Vacuum.

It is interesting to note that during the 1920's production rose so

TABLE 1—DISCOVERIES, PRODUCTION AND RESERVES IN THE UNITED STATES, 1895-1942
(In thousands of barrels)

Year	Discoveries (new fields)	Production	Reserves at end of year	Ratio of reserves to production
1942	269,700	1,384,528	20,675,899	14.9
1941	428,154	1,391,920	21,790,727	15.7
1940	902,616	1,340,030	22,554,493	16.8
1939	604,653	1,254,630	22,991,907	18.3
1938	2,085,030	1,200,875	23,641,884	19.7
1937	1,206,287	1,264,117	22,717,729	17.8
1936	1,841,311	1,089,162	22,815,559	21.0
1935	1,764,782	990,621	22,063,410	22.3
1934	1,923,960	908,065	21,289,249	23.4
1933	474,030	905,656	20,273,354	22.4
1932	864,955	785,159	20,704,980	26.4
1931	1,859,300	851,081	20,625,184	24.2
1930	5,595,690	898,011	19,616,965	21.8
1929	1,702,470	1,007,323	14,919,286	14.9
1928	1,824,860	901,474	14,224,139	16.8
1927	989,810	901,129	13,300,753	14.8
1926	1,910,370	770,829	13,212,072	17.1
1925	843,560	763,743	12,172,576	15.5
1924	580,680	713,940	11,992,759	16.8
1923	1,017,680	732,407	12,126,019	16.6
1922	1,487,240	557,531	11,840,746	21.2
1921	1,421,960	472,183	10,911,037	23.1
1920	1,156,630	442,929	9,961,260	22.4
1919	1,550,600	378,367	9,247,559	24.4
1918	499,380	355,928	8,075,326	22.7
1917	718,590	335,316	7,931,874	23.7
1916	245,680	300,104	7,559,600	25.3
1915	602,840	281,104	7,603,024	27.0
1914	320,750	265,763	7,281,288	27.4
1913	499,300	248,446	7,226,301	29.1
1912	711,530	222,935	6,975,447	31.3
1911	676,860	220,449	6,486,852	29.4
1910	148,630	209,557	6,029,441	28.8
1909	407,200	183,171	6,091,368	33.2
1908	506,700	178,527	5,867,339	32.9
1907	190,190	166,095	5,539,166	33.3
1906	959,760	126,494	5,515,071	43.6
1905	490,780	134,717	4,681,805	34.8
1904	216,420	117,081	4,325,742	36.9
1903	190,500	100,461	4,220,403	42.1
1902	164,570	88,767	4,136,364	46.6
1901	232,160	69,389	4,060,561	58.5
1900	1,483,150	63,621	3,897,790	61.3
1899	693,000	57,071	2,478,261	43.4
1898	64,600	55,364	1,842,332	33.3
1897	10,000	60,476	1,833,096	30.3
1896	39,000	60,960	1,883,572	30.9
1895	73,110	52,892	1,905,532	36.0
Previous years	2,539,985	653,671	1,886,314	

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rapidly that despite these large discoveries, the ratio of reserves to annual production declined steadily from around 23 to just below 15. The discovery of East Texas in 1930 gave the nation's reserves a tremendous boost and this was followed in 1931 by Conroe, K.M.A. Silica and Trapp.

These discoveries, together with shrinking demand due to the depression brought the ratio of reserves to production back above 26. Prices were near rock bottom and prospecting declined.

Improving conditions in 1934 brought about the first of another series of 5 billion-barrel years, with Goldsmith, Tom O'Connor, and Hastings, providing most of the new oil in that year. Wilmington, Monument and Anahuac, and other coastal fields kept up the pace in 1935, followed by Slaughter and Wasson in 1936, Webster (Friendswood) and other good-sized fields in 1937 and in the final year, 1938, Coles Levee and Coalinga Nose, in California, West Ranch on the Gulf Coast, Magnolia in Arkansas, and Salem and Louden in Illinois. From this point on, the discovery picture becomes somewhat dismal.

Peak Reached in 1938

Tinsley was the most important discovery in 1939. In 1940, it was Hawkins, with a revival of discoveries in the subsiding Illinois basin play. Some of the 1940 discoveries may reach the 100 million-barrel mark eventually and Quitman, a 1942 discovery, may also prove to be a major field but the trend has been definitely down for 4 years with no immediate prospect of an upturn. Based upon this year's estimates, the peak year of United States' reserves was 1938, with nearly 24,000,000,000 bbl. in sight. From that point on, production has exceeded discoveries by nearly 3,000,000,000 bbl. and the present ratio of reserves to production is again at the low level of the late 1920's. Although there is still an enormous reserve in East Texas, the effect of that field in boosting the nation's reserves has been overcome.

Fig. 1 shows that during the past 47 years, production has exceeded new oil found only during 10 years. Two of these were in the '90's when all of the production was in the East. A third year was at the depths of the depression and following East Texas when nobody wanted new oil. Three other years were temporary dips, preceded and followed by good years. But during the past 4 years, greater deficiencies have been recorded than during the previous oil history and there is no sign of a reversal.

The relationship between price and the ratio reserves : production also provides some interesting information. The relationship is of course complex. Attention must be called to the fact that many discoveries in California do not affect the eastern markets. There was also a pronounced inflation during the postwar period and the ratio between high-priced and low-priced products has varied. However, prior to 1926, the price of crude rose in general as the ratio of reserves to production decreased. In the late twenties this relationship was disturbed by the floods of oil coming from flush fields which depressed the price of crude, even though the backlog of oil in reserve was not great. However, even during this period the average price of crude ranged between $1.18 and $1.88. From 1930 to 1937, the normal relationship again existed and as reserves rose, prices fell and vice versa. A slight rise in reserves in 1938 accompanied a decline in the price of crude but at this point the relationship ceased to have any bearing. From 1938 on, the amount of oil available has declined and prices are still below the 1937 level. Even the minor variations between 1926 and 1928 show conformity between the two curves. There is no parallel to the present trend since the deflationary period of the early twenties when economic conditions were far from similar to those of today.

Higher Ceiling Only Way to Avert Crude Shortage, Committee Finds

by Paul Reed

ST. LOUIS, Mo.—A shortage of oil threatening to interfere with the prosecution of the war can only be averted by an increase in the ceiling of crude-oil prices, according to conclusions reached here March 24 by the Crude Oil Requirements Committee, presided over by H. B. Fell, which represents producers' associations in the principal producing states of the country.

Even though the Government modifies regulations so that necessary labor and materials may be available for both drilling and producing organizations and even if restrictions hampering exploration and development programs were removed, it was asserted that crude-oil production could not be increased to meet national wartime and essential civilian requirements unless such a crude-price increase comes to offset larger expenses incurred under present conditions. If this increase is granted, the price would still be considerably below parity with other essential raw materials according to any method of comparison, it was pointed out after the status of commodity prices had been reviewed. The study showed that other commodity prices have advanced very substantially while the price of crude oil remained at prewar levels, although petroleum is becoming constantly more important for military and naval success.

Since the operators represented on the committee are primarily concerned with oil production rather than with integrated operations it was regarded as their responsibility to bring the production situation to the attention of federal authorities.

A resolution was adopted asking appointment of a committee to present the facts to the president, the petroleum administrator for war and his staff, Office of Price Administration, Congress and, through the press, to the country at large. The following measures were recommended: (1) Deferment from Army service of essential geological and geophysical workers; (2) increase in amounts of steel in proportion with the rest of the war effort to facilitate exploratory work for new production; (3) permission to increase the price of crude for meeting rising costs and increased exploratory risks.

In comparing experience, it was found that the expenses of many producers had risen through withdrawal of employes by the war and by industries "not restricted by inadequate price ceilings" and their replacement by less capable men. Other costs had increased because of present restrictions and difficulties in obtaining materials.

"Although oil producers have operated under regulations of government agencies for a period of 16 months," according to a statement in the resolution of the committee, "conditions have steadily grown worse. Profits of major integrated companies under present regulations do not reflect conditions of the independent producer. The small producer is generally operating at a loss. Certainly he cannot replace the oil he is currently producing and find new oil for the war effore, at existing prices. . . . It has been proved in the past that an adequate price for crude petroleum at the well results in the finding of the necessary reserves to provide sufficient productive capacity to meet all requirements."

Within a week the special commit-

tee will go to Washington. The Crude Oil Requirements Committee consists of the following men: Frank Buttram, chairman, H. B. Fell, Russell B. Brown, all officials of I.P.A.A.; Ralph Zook, Pennsylvania; H. W. McClure, Michigan; M. W. Shiarella, Kentucky; Clarence Smith, Illinois; Arch Dye, Indiana; E. B. Shawver, Kansas; J. Garfield Buell, Oklahoma; B. A. Hardy, Louisiana; O. C. Bailey, Arkansas; Van S. Welch, New Mexico; C. A. Johnson, California; R. S. Shannon, Rocky Mountain area; Charles McGaha, president, National Stripper Well Association, who represents Texas together with Charles F. Roeser, Walter F. Goldston, Joe Weaver, John Cowden, Walter W. Lechner and J. P. Coleman.

District 3 Oil Men Blast Federal Oil Buying

HOUSTON, Tex.—The Government's role as buyer and seller of oil and its products is an unwise one, calculated to dislocate normal trade relations, in the opinion of refiners. At a meeting here Wednesday, March 24, of the oil industry's District 3 general committee its views were expressed in a letter sent to Ralph K. Davies, deputy petroleum administrator, Washington, D. C.

At the present time the crude oil moved through the new government-owned 24-in. pipe line from Longview, Tex., to Norris City, Ill., is bought by the Government from producers. From Norris City the crude is transported by tank car (pending construction of another pipe line) to the Atlantic seaboard, where it is sold by the Government to refiners and marketers.

Purchase and sale of petroleum and its products by the Government, according to the District 3 committee in its communication sent to Mr. Davies, creates complications which could be avoided if this function were performed by the petroleum industry instead of by the Government. The committee believes the Government should act solely as transporter.

Normal relationships between sellers in the Southwest and buyers on the Atlantic seaboard should be maintained as far as possible during the war emergency, in the belief of the committee.

The unanimous opinion of the committee was that the Government should confine itself to the physical operation, the transportation of oil and its products, of the two big lines, leaving the buying and selling ends to the oil industry, the latter an unnecessary function of the Government.

The committee felt that the oil industry should assume the burden incident to the buying and selling, a relation that should be preserved.

Rich Oil Sand Discovered With Condensate at Katy Field

HOUSTON, Tex.—Discovery of an oil sand—a good one too—in the big Katy gas-distillate area of Waller and Harris counties has dropped a cluster of new problems into the laps of operators and petroleum administration officials. Also it has made the Katy field the point of liveliest interest on the Gulf Coast.

The well around which discussion centers is Stanolind Oil & Gas Co.'s Waller County wildcat, the 1 G. T. Pattison, in the J. M. Bennett Survey, 2½ miles from the nearest production in the Katy gas field. On a 24-hour potential test it flowed 153 bbl. of 45.3-gravity oil through ⅛-in. choke from perforations at 6,622-25 ft. Tubing pressure was 1,810 lb. and gas-oil ratio 2,364 lb. Casing was sealed. Total depth is 8,000 ft., and the oil sand was topped at 6,587 ft. It is the first oil produced in what, during the 8 years of its development, has been regarded as purely a gas-condensate area.

When the Pattison was spudded last December it was expected to find gas and distillate, if it should find anything. And it did find them in three different sands. At 7,338-45 ft. it tested 6.17 bbl. of fluid through ¼-in. choke in 2½ hours, 89 per cent of it distillate, accompanied by a daily gas volume of 3,250,000 cu. ft. Tubing pressure was 2,425 lb., casing pressure 2,650 lb., and gas-oil ratio 62,000. At 7,116-21 ft. it flowed 11,500,000 cu. ft. of wet gas through ⅜-in. choke, with tubing pressure 1,375 lb., casing pressure 2,754 lb., and gas-oil ratio 70,000. At 6,847-51 ft. it tested 99 bbl. of distillate and 3,660,000 cu. ft. of gas through ½-in. choke, with tubing pressure 1,800 lb., casing pressure 2,400 lb., and gas-oil ratio 37,000. But the well will be produced from the oil sand only.

During a series of closely watched tests there was speculation as to whether the Katy was extending the gas field or opening up an entirely new gas pool. That point has not been settled yet. More drilling will be required. And as to the significance of the unexpected oil strike three possibilities are named:

1. The oil sand may skirt the whole 45-mile perimeter of the Katy field.
2. It may be coextensive with the gas-condensate sands of the field.
3. The Stanolind well may merely have struck a pocket of oil.

Few subscribe to the "oil pocket" guess as even a likelihood. Opinion is general that a new and important oil pool has been discovered.

A conference, called by D. E. Buchanan, director in charge for District 3 of the Petroleum Administration for War, was held in Houston Saturday, March 27, to study problems which have emerged from the Stanolind discovery. It was attended by E. L. DeGolyer, assistant deputy petroleum administrator; J. Howard Marshall, chief counsel; E. H. Poe, director of the gas and natural-gasoline division, and oil operators who have holdings in the affected area. It was said no statement concerning the results of the conference would be given out till later in the week, when it was believed some definite conclusions might have been reached.

The conferees, who met in the PAW headquarters, considered plans for exploring the oil possibilities of the Katy area and for economical development of the gas-bearing acreage. Well-spacing rules, priorities, and unitization are among questions that must be studied. Although it was reported that no final solution of problems involved had been arrived at in the conference, progress was made, and confidence was expressed that the operators themselves would be able to establish a program acceptable to the PAW.

The proven Katy area extends roughly 5 miles north and south and the same distance east and west. It was a Stanolind well, the 1 J. W. Thorp, that opened it, in February 1935. It was a unitized test on a block of 2,480 acres, and the well was drilled after the block had been worked with reflection seismograph shooting. Interest in the block was divided as follows: Humble Oil & Refining Co., 29.03 per cent; Stanolind, 25.81 per cent; Amerada Petroleum Corp., 25.81 per cent; Sinclair Prairie Oil Co., 12.9 per cent; Tide Water Associated Oil Co., 3.25 per cent; Darby Petroleum Co., 3.2 per cent. Up to that time several wildcat tests had been drilled in the county, all failures.

Until last December the field was confined to southeastern Waller County. It was carried over into Harris County with completion of Humble 1 L. L. Scharff, in the J. W. McCutcheon Survey, 4 miles northeast of the known field. There are now 23 wells in the area, including the Pattison and the Humble 1 Harry Hebert, 5/7 mile to the east, which is awaiting permission to complete. The Pattison well is said to be the first one to test the 6,600-ft. level. One early well was abandoned after drilling into gas and salt water above that level.

XUM

W.P.R.A. Hears Plea for Higher Crude Prices, Product Compensation

by C. L. Henderson*

There are two steps which ultimately must be taken if all the oil and products and derivatives necessary to the war are to be produced. They are:

1. Directives that change yields or other industry operations should carry with them concurrent compensatory adjustments in ceiling prices.

2. The historical method of locating new reserves should be reinstated. This means the price of crude oil should be allowed to increase and at the same time corresponding increases should be made in the prices of petroleum products.

These conclusions stand out in this slightly abridged address of Mr. Henderson last week before the annual meeting of the Western Petroleum Refiners Association at Kansas City, Mo.

TWO years ago no one dreamed that the petroleum industry would have to reorganize its far-flung and complicated operations to accomplish what has been done. Almost overnight the long-established flow of petroleum products by tanker from the Gulf Coast to the eastern seaboard was abruptly interrupted by war, necessitating an immediate and almost complete change in manufacture, transportation, and distribution methods. There was a terrific and sudden decline in domestic consumption by reason of rubber and gasoline rationing. Some normal channels of operations were suddenly decreased to a mere trickle, or closed entirely. In their place came a confused frantic clamor for oil and oil products to go to foreign shores, for such things as 100-octane gasoline, synthetic rubber and other products, a demand unprecedented in size, diversity, and urgency.

All this to be done in the face of unparalleled shortages of construction materials and manpower. These needs made the task as perplexing as any ever faced by any industry.

Adaptability, combined with ingenuity and cooperation, has enabled us to accomplish what has so far been done without any dangerous interruption to the rhythm of production and distribution. One vital accomplishment is that we have been able to maintain the daily production of crude oil in 1942 at just about the 1941 level. Nor have we suspended technological advance. On the contrary, the forward march in technology has been violently accelerated. Probably a billion dollars is being invested for the manufacture of 100-octane gasoline, toluene, raw material for synthesis of rubber, and similar products.

Despite the accomplishment to date, it is highly probable that our problems have only just begun. For instance, a tremendous advancement has been made in transportation. Petroleum products are being moved to the East Coast in tank cars in unprecedented quantities. Even so, we all witnessed the alarming strain put on transportation by the North African campaign alone, and must realize that even including finished and projected pipe lines, transportation promises to be a major problem for the duration.

Manpower is another increasingly acute problem. A greater use of women in our industry is necessary. Each company should accelerate its training of women to take the places of men in offices, laboratories, refinery yards, and other places. Safety work must receive more attention because of the use of women and inexperienced employes. Some consideration should be given to women's place in our industry after the war.

Each company must make a closer study of its operation. Yield changes are necessitated by lessening in the demand for gasoline and increasing demand for other products. It is imperative that every refinery be kept running in order to insure adequate supplies of petroleum products at all times for all essential needs.

Production Maintenance Vital

A most vital problem is the maintenance of the necessary levels of oil production. Practical difficulties have caused a falling off in the discovery of producing oil wells and new producing areas, throwing more dependence on known reserves. No penny-wise nor pound-foolish policy that interferes with the depletion allowance for tax purposes should be permitted. Victory will come through the allied domination of oil. Exploration and resultant discoveries of new oil-producing areas must be actively prosecuted.

While the oil industry is thus engaged in these essential activities in producing and processing oil, without which the war cannot be won, there are certain obligations upon our government which must be met to maintain operations at the maximum efficiency. Government bureaus should study, before a directive, order, or request is issued, and give the industry a chance to solve the problem. This is a simple basically sound procedure which would save a great deal of confusion, and bring about quicker and more satisfactory results.

After the war, the competition for the consumer's dollar promises to be terrific. The established institutions of business, the familiar products will be in competition with new concerns and new products manufactured to a new higher level of performance. Harder selling will be needed to maintain a relative position in business compared to that before the war. Many concerns will suffer because of the changes incidental to conversion of industry to war economy and subsequent inability to reassemble competent personnel and equipment.

If we are to have anything after the war, other than utter chaos, we must have cooperation with private industry by government administration. An industry freed from fear of administration can plan its own reconversion. In a world where industry is accorded the respect due it as a builder of civilization, government construction projects and state-directed public works need play a minor role, if used at all. Government administration and industry can plan together and still the essentials of free competition can be preserved; and they must be if we are to have a civilized world in which to live and do business.

This is no time for definite decision as to steps we will take after the war. We are primarily concerned with the business at hand, but we must keep our ear to the ground. We must anticipate to the extent that we will be ready for some changes of a very definite character. We owe this much to those who look to us for the successful conduct of our respective institutions. Whether the Government is in or out of the oil business has little bearing on this point.

*President of Western Petroleum Refiners Association; president, Vickers Petroleum Co.

Refiners Hear Optimistic Report on Aviation Gasoline, Synthetic Rubber

by C. O. Willson

KANSAS CITY, Mo.—An optimistic report on the status of the aviation-gasoline and the synthetic-rubber programs was brought to the annual meeting of the Western Petroleum Refiners Association, held here March 25, by Bruce K. Brown, assistant deputy petroleum administrator. The PAW refinery chief said that despite the delays in construction, largely brought about by material shortages, plants to manufacture approximately 50 per cent of the expected peak war requirements for aviation gasoline would be in operation by June. The completion of additional plants, now authorized, by the end of the year will greatly augment the midyear production.

The abbreviated synthetic-rubber program, recently announced by Rubber Director Jeffers, will also be completed by the end of the year, Mr. Brown predicted, with the further observation that the completed plants, involving new arts in manufacturing, will be operated satisfactorily.

Mr. Brown's informal talk to Middle West and Mid-Continent refiners was a feature of the 1-day "streamlined" program of the association which took the place of the usual 3-day meeting. The meeting was opened by C. L. Henderson, president, who with other speakers emphasized that as great as the accomplishments of the refining industry have been over the past year there were many additional problems for this year which must be solved.

Mr. Henderson was reelected, for his fourth term, president of the association. All other officers and directors were reelected with two additions to the board.

H. T. Ashton, general manager of the Lubrite Division, Socony-Vacuum Oil Co., Inc., St. Louis, Mo., was the guest of honor at the association's dinner following the business sessions. Several speakers paid tribute to the association and to the oil-industry activities of Mr. Ashton who has been a member of the board of directors for the past 25 years. He has served as acting president of the association and was executive vice president for a period. A picture and a sketch of Mr. Ashton appear in the March 25 issue of The Oil and Gas Journal, page 359.

Resolutions in memoriam were adopted for two well-known members of the association who died last year—George D. Locke, former president, and Charles S. Smith, formerly of National Refining Co.

Brown's Talk

In regard to the aviation program, Mr. Brown explained that new-construction proposals were still being considered for the West Coast and Rocky Mountain states. East of the Rocky Mountain states, PAW is only interested in receiving proposals involving a minimum use of new materials.

It will be necessary for refiners to process approximately 3,000,000 bbl. of crude oil daily to supply the raw materials from which aviation gasoline, butadiene, and other war products are manufactured, Mr. Brown said. This figure does not include the quantities required for fuel oil, coke and asphalt which increase the total to approximately 4,000,000 bbl. daily. This means a continuance of crude demand at about prewar requirements, Mr. Brown pointed out, but involves a different distribution of the supply from schedules in effect at that time. He held out the possibility that the war-product demand for crude oil might be reduced later because the actual production of the war plants may exceed the rated capacity at that time.

Mr. Brown emphasized the strong war-product position of the Gulf Coast refining area with the transportation of war output and products for civilians the main problem of that group of refiners. He said all but 10 per cent of the crude run to stills at refineries in that area contributed directly to the production of war products.

Regarding the accomplishments of West Coast refiners he explained the reduction in yields of civilian grades of motor fuels and the large increase in yields of aviation gasolines. Some of the difficulties in operation in that area include a shortage of butane and a shortage of crudes with the properties required for the production of 50-cetane diesel fuels.

Mr. Brown paid tribute to the wide-scale employment of women by refiners in California where the man-

(Continued on Page 27)

C. L. Henderson, president of W.P.R.A., speaking at the annual meeting, Kansas City. Others at the speakers' table were: Robert N. Sears, District 4 director of refining, PAW; Paul G. Blazer, president, Ashland Oil & Refining Co.; Bruce K. Brown, assistant deputy administrator, PAW; R. R. Irwin, manager, White Eagle division, Socony-Vacuum Oil Co., chairman of the meeting, and John Day, secretary W.P.R.A.

State Capitals

LOUISIANA

THE CONSERVATION COMMISSION March 26 set the April daily allowable for the state's oil fields at 358,218 bbl. This compared with 348,148 bbl. in March. North Louisiana's April allowable is 87,614 bbl. daily compared with 85,455 bbl. in March. South Louisiana's allowable is 270,604 bbl. per day compared with 262,693 bbl. in March. The increase followed higher recommendations from PAW, which set the state quota for all petroleum liquid products at 353,300 bbl. daily in April, compared with 341,300 in March.

TEXAS

TEXAS OPERATORS have received order from the Railroad Commission authorizing production of 1,473,048 bbl. of oil daily effective April 1. Figuring in 118,000 bbl. of distillate, and allowing for underproduction of 90,742 bbl., the commission estimated that on April 1, Texas would be 1,658 bbl. below the quota certified by PAW of 1,502,000 bbl. daily.

The state-wide order provides for 19 producing days during April, including East Texas. Several fields and areas producing special types of crude are authorized to produce a greater number of days during the month.

NET ALLOWABLES BY DISTRICTS

	April	March
1. Southwest	20,190	20,443
2. Southwest	89,653	83,383
3. Gulf Coast	331,877	340,509
4. Southwest	127,347	109,870
5. East Central	18,023	18,498
6. East Texas (outside)	84,385	87,304
6. East Texas	322,993	328,290
7-C. West Central	17,984	18,900
7-B. West Central	28,127	27,770
8. West Texas	206,640	209,870
9. North Texas	127,966	127,894
10. Panhandle	97,890	98,479

REFINERS in the state have been queried by questionnaire sent out by the Railroad Commission as to how much sour crude they are taking and whether they are equipped to purchase and refine more of it. In a formal statement by Ernest O. Thompson, member of the commission, he said that the time is fast approaching when sour crudes are going to have to be used, and that refineries not equipped to use them should so equip themselves so that a fair share of the market may be enjoyed by all the fields in Texas. He added that the situation was particularly bad in West Texas where refiners declined to use sour crude in favor of sweeter types.

The commission, together with a large delegation of West Texas oil operators, will presently submit to Petroleum Administrator Ickes a comprehensive plan to break the transportation and equipment blockade of West Texas sour crudes from war markets. The delegation is pledged to spend as much as $15,000,000 in personal funds to expedite the flow of West Texas reserves to war-consumption areas. It will be headed by one of the state's most prominent producers. Details of the plan have not been revealed.

OKLAHOMA

THE BILL PERMITTING secondary recovery of oil on a unitized basis was killed by the lower house last week, despite an effort on the part of John Steele Batson, the author, to save it. The bill died by a voice vote in committee of the whole. The opposition declared that small royalty owners and oil operators would be forced into a program of secondary recovery against their will. Mr. Batson declared, however, that all parties involved in any unitization program would be fully protected.

COLORADO

A CALL upon operators in the Rocky Mountain area to expand their wildcatting campaign in 1943 has been issued by members of PAW District 4 production committee following a meeting at Denver. The district PAW Materials Division promised every assistance in securing equipment and supplies for this purpose and all indications point to a favorable response by the industry. The action of the committee is in line with Administrator Harold L. Ickes' recent challenge to the industry to drill 4,500 wildcats this year to maintain the nation's petroleum reserves in the war effort.

R. S. Shannon, chairman of District 4 production committee and president of the Minnelusa Oil Corp., quoted O. D. Donnell, chairman of the national PIWC production committee, and W. B. Heroy, national director of reserves for PAW, as saying they are looking to the Rocky Mountain area for a substantial increase in new reserves.

MONTANA

A new spacing plan for the Kevin-Sunburst field in northern Montana under M-68 has gone into effect, allowing the drilling of wells on the basis of one well to 10 acres. This action followed the filing of an application for exception to Conservation Order M-68 by the operators and an investigation of the situation by A. W. Weeks, principal petroleum development analyst for PAW for District 4. The order was issued by the War Production Board upon the recommendation of PAW. Some time ago spacing was set at one well to each 20 acres, but the operators showed that even that pattern resulted in higher production costs than the drilling warranted.

ILLINOIS

THE SUPREME COURT has denied a rehearing of a Franklin County Circuit Court decree, which it upheld January 21, in an opinion declaring that a document conveying coal, oil, gas and other mineral rights carried with it the right to use the surface to drill for oil without an express provision.

MICHIGAN

THE STATE'S crude-oil production in April will fall nearly 20,000 bbl. short of state refineries' demand, the state Oil Advisory Board contended this week as it demanded decentralization of the authority of the federal oil coordinator to allow relief for states distressed by its order. F. R. Frye, state petroleum engineer, told the board Michigan April production would not exceed 56,000 bbl., lowest this year, and that this contrasted with refineries' orders for 64,775 bbl. Resources are dwindling, he said, wells are less productive and federal regulations have handicapped exploration encouragement efforts.

The board went on record asking the Interstate Oil Compact Commission to intercede in an effort to have the petroleum administrator delegate more power to district offices. Michigan oil officials are particularly anxious for permission for closer spacing of wells in shallow fields, contending the 40-acre limitation prevents proper recovery from the oil fields. A spacing-modification petition has remained unanswered for several months, Mr. Frye said.

FOUNDED IN 1910

BY PATRICK C. BOYLE

the OIL AND GAS JOURNAL

The Proof of the PIWC

AS the petroleum industry moves from the emergency phases of its war contributions to the more settled and long-range responsibilities there is every reason why it should continue the pattern of cooperative endeavor through the Petroleum Industry War Council which has proved so successful during 16 months of defense and war effort.

The proof of the pudding is in the eating and the proof of what the oil industry and its PIWC can do during the remainder of the emergency and in the postwar period, is best revealed by what it has done during a most critical interval.

It is certain that the impossible of a few months ago has been accomplished in supplying tens of millions of consumers during the heating season now closing. There was rationing and there was suffering as a result but the supplies were sufficient to avoid the threatened national disaster.

This attests to the fact that petroleum industry has been able to offset, in large measure, the right arm which it lost shortly after Pearl Harbor when coastwise transportation was reduced to a minimum. Outsiders are pointing to this as the outstanding civilian accomplishment of the war.

There is also every reason to believe that the all-important gap in the entire United Nations war program, created by the loss of the natural rubber of the Southwest Pacific, will be largely closed by the end of the year through synthetic operations centering in the activities of petroleum refiners.

The 100-octane gasoline and the toluene production plans, despite the early delays in procedure, are now moving so fast that the enemy points to reports of what is being done as evidence of the "lying propaganda" of "unprepared America."

These are solutions to problems that came to the petroleum industry overnight. They are evidence of the soundness of an industry-government plan—PIWC and PAW—which placed most of the war's petroleum responsibilities squarely on the shoulders of operators. Working together, these producers, refiners, transporters, and distributors found out what had to be done and did it.

The solutions got us through emergencies which brought a turn in the war tide in favor of the Allies. The war has no better exhibit—nor will it have—of achievement, emanating from an industry which was motivated by a unity of purpose and which presented a solid front through its own war agency in the solution of common problems.

There are additional difficulties ahead, some more trying and basic than those of the past few months. The makeshifts will have to have permanent supports. More emphasis will be placed on considered rather than immediate actions. The oil business must be able to look down the road a long way if it is to do what will be expected of it and if it is to continue as an aggressive and independent enterprise after the war is over.

The petroleum industry is rapidly sweeping from its floors the inevitable litter of misunderstanding and confusion that came in shifting rapidly from a peacetime to a wartime economy. It has the established and proven framework with which to study and to act. Its agency personnel has the training that comes only from experience.

Now is the time for the entire industry to rally around its war council and its friendly governmental affiliate, looking forward to new problems and to new accomplishments.

CALIFORNIA SPACING TO BE RELAXED

by L. P. Stockman

LOS ANGELES, Calif. — The 1943 annual spring meeting of the American Petroleum Institute's Pacific Coast district, Division of Production, held here March 23, was officially designated as a wartime conference and although restricted to an evening dinner session attracted about 750 members and guests.

Herbert R. Gallagher, director in charge of PAW's District 5 office, the guest of honor, revealed that a new M-68-3 order will be issued shortly to afford wider freedom for the drilling of new wells. He said that he could not tell in terms of barrels how much oil will be needed from California but that operators must be prepared to supply more than is now in sight.

"It would be a sad and humiliating day for every one of us," Mr. Gallagher said, "if we failed in not having done everything within our power to take care of our part in the fight. Everyone here knows it is imperative to develop more reserves of oil in California. That can only be done by drilling more wells. This job of getting the oil has been turned over to you and you have to do it. I hope it will bring the largest drilling program that California has seen in many years. Everyone knows there are manpower difficulties, some materials difficulties, although I am informed that this situation is and will be relieved, economic difficulties and all kinds of difficulties. But when have we not had difficulties, and who has ever accepted them as an alibi? We must have more reserves and more oil in sight and you oil men of California know better than anyone how to get it. You have a proud record of getting oil when it was needed. You certainly do not want to call for help when the fight comes to you. Mr. Ickes and Ralph Davies, who are closely in touch with the national and military requirements, are greatly concerned over the fear that California will not have the necessary oil at the time it will be required and that we here are not getting ahead fast enough with our drilling to develop greater reserves and get more oil in sight."

Following Mr. Gallagher's address, E. E. Pyles, chairman of the production committee for District 5 and coordinator for the California Conservation Committee, conducted a symposium on the procedure for scheduling California crude-oil production during wartime. This symposium revealed what steps are taken each month before operators receive the allotments for the various fields. The statistical committee determines among other things the minimum economic stocks necessary to be maintained and the demand for crude oil. The refinery committee then estimates the type and amount of crude oil that will be required to produce the necessary refined products, giving consideration to the fact there are eight distinct classes of crude in California, including some especially suited for lubricating-oil production and others that will yield special types of fuel oil for Navy use. In determining how much of each grade or quality of crude oil is needed, it is necessary to check 250 separate pools. The monthly allocation among pools equals the demand for each type of crude oil. No serious bottlenecks now exist in transportation to make these various grades of crude oil available to refiners.

Demand Surveys Synchronized

While the refinery committee is making its survey, the committee on natural gas and gasoline is also determining its needs in order to prevent any shortage. William Moeller, Jr., of Southern California Gas Co. and chairman of the natural gas and gasoline committee, outlined the task of this committee and indicated that only 1.3 per cent of natural-gas production in California is unconserved. This is the lowest per cent of gas waste ever achieved and shows the efficiency of the various conservation committees.

Carlton Beal, Richfield Oil Corp., Los Angeles, Calif., new chairman of the A.P.I. Pacific Coast district, Division of Production

A. C. Saul of Shell Oil Co., Inc., a member of the transportation committee, said the most significant development from a transportation standpoint was the conversion of 177 miles of 22-26-in. Stanpac line from natural gas to crude oil. This line was owned jointly by Pacific Gas & Electric Co. and Standard Oil Co. but when the crisis developed the former surrendered its interest for the duration and the latter took over control of operation on a rental basis. This line is moving about 125,000 bbl. of crude oil daily but handles only the lightest grades. Other existing lines extending northward out of the San Joaquin Valley are handling heavier crude and have done this by stepping up operating pressures. This tieup of pipe-line facilities is interesting because San Joaquin Valley production today is 91,000 bbl. per day higher than it was 18 months ago and at the same time tanker loadings have decreased 50,000 bbl. daily.

Other Lines Converted

While Standard Oil Co. of California was converting the Stanpac line to crude service, Tide Water Associated Oil Co. reclaimed 45 miles of pipe and laid it to join its Kern line, extending north from Kern River, and the Coalinga line, extending northward to the junction with the Kern line. This increased capacity of the line about 75 per cent. Shell's 83-mile Ventura-Wilmington pipe line has also stepped up its capacity as it was handling about 38,000 bbl. daily and is now running 47,000 bbl. per day. In addition to this constructive work, California refiners and marketers are exchanging refined products to reduce the amount of transportation required. E. C. Babson, past chairman of the engineering subcommittee, outlined the functions of this group and W. R. Wardner, manager, California Conservation Committee, discussed the administration of the various orders and directives. L. E. Porter, Richfield Oil Corp., chairman of the allocation committee, discussed functions of this group.

Carlton Beal, Richfield Oil Corp., was elected chairman of the Pacific Coast district, succeeding Ernest K. Parks. W. G. Corey was reelected treasurer and D. S. Kilgour was reelected secretary.

The advisory committee for the

next year includes Mr. Parks, L. L. Aubert, A. H. Bell, L. A. Cranson, L. C. Decius, J. F. Dodge, E. G. Gaylord, E. B. Hall, R. P. Huggins, William Keck, Jr., W. N. Lacey, R. D. Montgomery, R. C. Patterson, Mr. Pyles, B. H. Robinson, J. B. Sutherland, E. P. Tallant, C. P. Watson, D. K. Weaver, J. T. Wood, Jr., H. T. Wyatt and Mr. Beal.

PAW Is Authorized To Delegate Oil Powers

WASHINGTON, D. C.—An amendment to the executive order creating the Petroleum Administration for War has been issued by the president to permit further delegation of authority by the administrator.

The original order permitted delegation of authority to a deputy administrator, and the amendment permits either to delegate authority to other personnel of PAW. It also permits PAW to utilize other agencies of the Government to carry out the functions of the Petroleum Administration.

EXECUTIVE ORDER 9319

Amending Executive Order No. 9276 entitled "Establishing the Petroleum Administration for War and Defining Its Functions and Duties."

By virtue of the authority vested in me by the Constitution and statutes, as President of the United States and Commander in Chief of the Army and Navy, and in order to facilitate the performance of the responsibilities of the petroleum administrator, Paragraph 7 of Executive Order 9276 of December 2, 1942, entitled "Establishing the Petroleum Administration for War and Defining Its Functions and Duties," is hereby amended to read as follows:

"7. The administrator may appoint, with the approval of the president, a deputy administrator, who shall report directly to the administrator, and to whom he may delegate any and all power, authority, and discretion conferred upon him by this order. The deputy administrator shall serve as acting administrator in the absence of the administrator. The administrator and deputy administrator may (a) exercise the powers, authority, and discretion conferred upon them by or under the provisions of this order through such personnel of the Petroleum Administration for War and in such manner as the administrator or deputy administrator may determine, and (b) accept the services of other agencies and officials of the Government in carrying out the purposes of this order. The administrator, within the limits of such funds as may be allocated or appropriated for the purpose, may employ necessary personnel and make provision for necessary supplies, facilities, travel, and services."

Federal Order Digest

OPA Price Actions

Crude Oil—RPS 88, Amendment 87: Raises maximum ceiling on low-gravity crudes in specified California fields 25 cents per barrel, effective March 26.

Fuel Oil—RPS 88, Amendment 87: Advance ceiling on Pacific Standard 300 and 400 fuel oil and Navy Grade Special fuel 25 cents per barrel throughout California, Washington and Oregon, in all classes of markets, effective March 26.

Asphalt—MPR 323, Amendment 1: Lifts ceiling price on asphalt in the Pacific Coast area $1.40 per ton, effective March 26.

Crude Oil—RPS 88, Amendment 83: Authorizes seller as well as purchaser to set tentative maximum price at the well; authorizes seller and buyer, who have agreed on tentative price, to make quotation retroactive, when approved by OPA, effective March 24.

Fuel Oil—RPS 88, Amendment 84: Rules that provisions of Revised Procedural Regulation 1 applies to petitions for exceptions under RPS 88, stipulating requirements for filing petitions for individual price action, effective April 2.

Reusable Steel Pipe—Rev. MPR 230, corrected: Corrects typographical and other errors in parts of two price tables in RMPR 230, reissued in final form March 25, order effective February 3.

OPA Ration Orders

Heating Stoves—RO 9, Amendment 6: Broadens the list of those eligible to apply for ration certificates to purchase coal-burning stoves including industries, institutions, hospitals, clinics and others qualifying under its "living," "war effort," "public health" or "safety" provisions, effective March 25.

Fuel Oil—RO 11, Amendment 53: Permits restrictions on consumption of fuel oil for nonheating purposes by commercial and industrial concerns and governmental agencies in District 1 to expire on April 1, except for electrical power generation, effective April 1.

Petroleum Administration

Materials—PRO P-98-c, amended: Simplifies and concentrates all controls over materials inventories in the petroleum industry, defines "surplus material," provides a method of accounting for transfers of material from domestic operations to foreign operations and establishes participation on and after May 1, in the PAW Materials Redistribution Program 2, as a prerequisite to securing any materials for use in the petroleum industry, issued March 24 by WPB, over joint WPB and PAW statement.

General Procedure — CO M-68, M-68-c, LO L-56 and L-70: Speeds up administrative procedure in handling exceptions, appeals or rejections under these four WPB orders by providing that all documents or papers will be issued over signature of Ralph K. Davies, deputy administrator, effective March 22.

Fuel Oil—PDO 3, SO 1: Prevents marketers from supplying fuel oil to electric power generating consumers, having capacity of 100 kw. or more, effective April 8.

WPB Limitation Orders

Carbon Steel Plates — LO L-211, Schedule 8: Reduces the number which may be produced under standard specifications from several hundred to approximately 25, issued March 22.

Petroleum Sulfonates—GPO M-188, amended: Assigns equal authority in administration of order to petroleum administrator or deputy administrator, issued March 27.

Mineral Oil Polymers—GPO M-258, amended: Assigns administrative authority to petroleum administrator or deputy administrator, issued March 27.

Thermoplastics—GPO M-154: Revises list of civilian products for which thermoplastics may no longer be used, issued March 26.

Industrial Funnels — SLO L-30-a, amended: Grants quota allowance to manufacturers of industrial funnels to permit production of accessories for use in mining operations and petroleum distribution, issued March 22.

War Manpower Orders

Essential Activities—Revises lists of activities essential to carrying on the war, including a detailed index of products, services and facilities involved; covers 35 groups, including production and manufacture of all fuels, announced March 25.

Controlled Materials Orders

Petroleum Supplies—Exempts petroleum operators and utilities producers from the inventory provisions of CMPR 2, reverting control to P-98-c and U-1, issued March 27.

Critical Materials—CMPR 1, Interpretation: Asserts that duplication of orders for allotted materials is in violation of the law. Aimed at halting the practice of placing more than one order for the aluminum, copper or steel allotted, issued March 22.

Defense Supplies

Kerosene Shipping Costs—DSC will continue for period of 3 months, from April 1, to absorb the extraordinary costs incurred in shipping kerosene into the North Atlantic states in steel drums, issued March 25.

PETROLEUM ADMINISTRATIVE ORDER 11

Highlights Extracted from Text of the New Regulation on Purchase, Use of Equipment

Section A.—Definitions materially different from those of M-68 include:

5. "Production operation" means any use of material for construction, expansion, improvement, reconstruction, remodeling, alteration, maintenance, repair, or replacement incident to production.

6. "Maintenances of repair" means (without regard to accounting practice) any use of material in production consisting of any of the following:

(i) The upkeep of material or equipment in a sound working condition; or

(ii) The restoration of material or equipment which has been rendered unsafe or unfit for service by wear and tear, damage, destruction, failure of parts or similar causes; or

(iii) A capital addition (excluding the installation or replacement of pumping or other artificial-lifting equipment and the deepening or plugging back of any well) not exceeding in material cost $500 for any one complete operation which has not been subdivided for the purpose of coming within this definition.

Provided, that upkeep or restoration shall not include any use of material for the improvement of material or equipment by the replacement of material which is still serviceable in the existing material or equipment.

7. "Exploratory well" means any well located at least 2 miles from every drilling or producible well; provided, that exploratory well shall not include any well located in any field or area which at the time of the drilling of such well has been "proven" to be productive only of gas or condensate, or both, by the drilling of wells other than such well.

9. "Lease equipment" means fixed or stationary equipment or material for direct or indirect use in production installed on any property located within the productive boundaries of any field including but not limited to oil-treating equipment, salt-water disposal or injection equipment, fresh-water wells and the equipment therefor, or production office or camp facilities located adjacent to any field; provided, that lease equipment shall not include: an oil, gas, or condensate well equipment, pumping or artificial-lifting facilities, or flow, lead, and gathering lines for such well; cycling plants; pressure-maintenance plants; secondary-recovery plants; or plants for the extraction or recovery of natural gasoline and associated hydrocarbons or for other treatment or processing of gas.

"Property interest" means any interest of an oil or gas lessee; provided, that where no oil or gas lease exists on any parcel of land, the property interest in such land shall be deemed to be the aggregate of the interests in such land covering the right to drill for and produce petroleum.

Restrictions on Material

Section C.—Restrictions on acquisition and use of material.

Subject to the provisions of Paragraph F of this order, no person shall accept delivery of, acquire, or use material for a production operation except where:

1. Such material is to be used for maintenance or repair.

2. Such material is to be used exclusively for operations directly involved in the search for and discovery of a previously unknown pool by means of geological, geophysical, or geochemical prospecting, or the drilling or completion of any exploratory well.

3. Such material is to be used to complete any well actually being drilled on March 31, 1943, in conformity with any previously issued Conservation Order M-68 (Sec. 1047.1), or supplementary order thereto.

4. Such material is to be used to construct, install, or extend a crude-oil gathering line from the first valve on the discharge side of the lease or field shipping tank or battery where petroleum is first gaged to any transportation facility or such material is to be used to construct, install, or extend a field gathering line for the transmission of gas from the well-head connection to the point at which such gas leaves the gathering line; provided, that material shall not be used to construct, install, or extent any such gathering line, except:

(i) Which duplicates in whole or in part the transportation functions of any existing gathering line or gathering lines; or

(ii) Which has a material cost when completed of more than $2,500.

Pumping-Equipment Limits

5. Such material is to be used for pumping or other artificial-lifting equipment to be installed on a well located on any lease or tract on which the number of wells to which pumping or other artificial-lifting equipment is attached does not at any time exceed an average of one well to every 10 surface acres of the part or parts of such lease or tract which are contained within the productive limits of the field; or such material is to be used for pumping or other artificial-lifting equipment to be installed on a well located on any lease or tract of 10 acres or less on which no other well is located to which pumping or other artificial-lifting equipment is attached and which lease or tract has not been subdivided or rearranged for the purpose of making the provisions hereof available.

6. Such material is to be used to drill, complete, equip, connect, or provide additions to any oil well in any discovered oil field (other than a condensate field) in which the surface is divided into quarter-quarter sections (north, south, east or west quarter-quarters), on a quarter-quarter section of at least 35 surface acres in conformity with a uniform well-spacing pattern, as defined by Paragraph D (1) of this order, of not more than one single drilling or producible well to each such quarter-quarter section.

7. Such material is to be used to drill, complete, equip, connect, or provide additions to any oil well in any discovered oil field (other than a condensate field) in which the surface is not divided into quarter-quarter sections, in conformity with a uniform well-spacing pattern as defined by Paragraph D (2) of this order, of not more than one single drilling or producible well to each 40 surface acres.

8. Such material is to be used for lease equipment.

9. Such material is to be used to plug back and recomplete any oil well which conforms to all of the provisions of Paragraph C (6) or C (7), whichever is applicable, except the provisions requiring that such well be the only well located upon the drilling unit and that such well be located at least 990 ft. from every other drilling or producible well; provided, that such well is not recompleted as a gas or condensate well.

10. Such material is to be used in conformity with an exception issued under Conservation Order M-68 in response to an application in accordance with any OPC Form PD-214, an order issued as a supplement to this order, or an authorization of the Petroleum Administration for War issued in responce to an application filed in accordance with Paragraph G (9) this order.

Determination of Pattern

Section D.—Determination of uniform well-spacing pattern.

1. Quarter-quarter section drilling units. Each oil well located on a drilling unit consisting of a quarter-quarter section of at least 35 surface acres, pursuant to Paragraph C (6) of this order, shall be drilled in accordance with a uniform well-spacing pattern, only where:

(i) Such well bears the same geographical relationship to the quarter-quarter section on which it is drilled as the first well spudded in the same field, subsequent to December 23, 1941, on an approximately square drilling unit (consisting of at least 40 surface acres or a quarter-quarter section of at least 35 surface acres), bears to the drilling unit upon which it is located; provided, that any well located within 100 ft. of the point at which an identical geographical relationship would be attained or within 150 ft. of the center of a quarter-quarter section shall, subject to Paragraphs D (1) (iii) to D (1) (vii), inclusive, be deemed to conform to a uniform well-spacing pattern; or

(ii) Such well conforms only to Paragraphs D (1) (iii) to D (1) (vii), inclusive, if it is the first well spudded in the field subsequent to December 23, 1941, on an approximately square drilling unit (consisting of at least 40 surface acres or a quarter-quarter section of at least 35 surface acres); and

(iii) All separate property interests in the quarter-quarter section upon which such well is drilled are first consolidated with each other; and

(iv) Such well is the only drilling or producible well located on the quarter-quarter section; and

(v) Such well is drilled at least 990 ft. from every other drilling or producible well; and

(vi) Such well is drilled at least 330 ft. from every lease line, property line, or subdivision line which separates unconsolidated property interests and from every border of the quarter-quarter section upon which such well is located; and

(vii) Such well is drilled with due diligence to maintain a vertical well-bore.

2. Drilling units other than quarter-quarter sections.

Each oil well located on a drilling unit consisting of not less than 40 surface acres, pursuant to Paragraph C (7) of this order, shall be drilled in accordance with a uniform well-spacing pattern, only where:

(i) The drilling unit upon which such well is drilled consists entirely of acreage which is not attributable to any other oil well located within the same lease or property; and

(ii) All separate property interests in the

drilling unit upon which such well is drilled are first consolidated with each other; and

(iii) The direct linear distance between any two points which are farthest removed from each other on the drilling unit upon which such well is drilled does not exceed the length of the diagonal of the rectangle, the length of which is twice its width and which is equivalent in surface acreage to such drilling unit; and

(iv) No portion of the drilling unit attributed to such well falls within 330 ft. of any other drilling or producible well located within the same lease or property; and

(v) Such well is drilled at least 990 ft. from every other drilling or producible well; and

(vi) Such well is drilled at least 330 ft. from every lease line, property line, or subdivision line which separates unconsolidated property interests; and

(vii) Such well is drilled with diligence to maintain a vertical well-bore.

How to Compute Acreage

Section E.—Computation of attributable acreage.

1. The acreage attributable to any well spudded on or before December 23, 1941, shall be determined by assigning to such well an acreage equivalent to that in the existing well density or drilling pattern contiguous to such well.

2. The acreage attributable to any well spudded subsequent to December 23, 1941, shall be the same as the drilling unit assigned to such well pursuant to Conservation Order M-68, any supplementary M-68 order, any exception issued pursuant to a determination under Conservation Order M-68, or pursuant to this order, any order issued as a supplement to this order or any authorization issued in response to an application filed in accordance with Paragraph G of this order, whichever is applicable.

Section F.—Restrictions on installation of pumping or other artificial-lifting equipment.

Notwithstanding the provisions of Paragraphs C (5), C (6), C (7), and C (9), no person shall install pumping or other artificial-lifting equipment upon any well prior to the time at which such well ceases to flow naturally or upon any well which will not be produced immediately after the installation of such pumping or other artificial-lifting equipment and continuously thereafter to the extent permitted by law; provided, that the provisions of this paragraph shall not apply to the installation of pumping or other artificial-lifting equipment upon any well which has ceased to flow naturally at a rate at least equal to its "allowable production."

Section G.—Application for exceptions pursuant to Paragraph C (10).

1. Applications for exception (authorization to accept delivery of, acquire, or use material for a production operation which does not conform to the provisions of Paragraphs C (1) to C (9), inclusive, shall be made under Paragraph C (10) of this order in quadruplicate by letter and shall contain:

(i) The information specified in PAW Form 3 for any operation directly incident to the discovery, development or depletion of petroleum pools.

(ii) The information specified in PAW Form 4 for any operation incident to the extraction or recovery of natural gasoline or associated hydrocarbons.

2. Information required for an authorization to accept delivery of, acquire, or use material shall be addressed to:

(i) The director of production when a crude-oil operation, including pressure maintenance, repressuring, and secondary-recovery operation; or

(ii) The director of natural gas and natural gasoline when a natural gas, natural gasoline, or condensate operation.

Such information shall, unless otherwise directed, be submitted to the Petroleum Administration for War, Interior Building, Washington, D. C., Ref: PAO 88.

Section H. — Revokes Orders M-68-1, M-68-2, M-68-4, M-68-6, PAO-2, and PAO-6, as amended:

"Except with respect to wells the actual physical drilling of which was either commenced or concluded pursuant to any such order on or prior to March 31, 1943, or except with respect to natural-gasoline extraction plants the construction, expansion, improvement, reconstruction, remodeling, or alteration of which was either commenced or concluded pursuant to any such order on or prior to March 31, 1943. This action shall not be construed to relieve any person of the necessity of complying with any such order as to any well purportedly spudded under such order on or prior to March 31, 1943, or to affect any liabilities or penalties incurred thereunder, or to affect the status of any administrative process, any prosecution or the application of any penalty in connection with any such liabilities."

The order also includes Exhibit A, listing condensate fields; text of PAW Form 3 used to obtain exceptions for development of any oil, gas, or condensate field; PAW Form 4 to obtain exception for construction incident to extraction of natural gasoline; and texts of Supplemental Orders 1, 2, 3, and 4.

Operators Required to Report Surplus Material

WASHINGTON, D. C.—No operator in the oil industry may obtain any priority assistance in securing new materials after May 1 unless he has reported all surplus material and made an attempt to meet his requirements with material owned by other operators, under the terms of "Materials Redistribution Program No. 2," soon to be issued by the Petroleum Administration for War.

On a special form every operator must report to his PAW district office all surplus materials in his inventory, meaning any article with a unit value of $15 or more new which will not be used by him during the next 90 days. He will then be given a serial number, and no priority application for new material will be considered unless it bears an outstanding serial number.

Every applicant for priorities to obtain new material will be informed by PAW of the location of surplus material in the inventory of some other operator, and unless the applicant within 15 days gives PAW a valid reason why he has not been able to obtain and use this surplus material his priority application will be considered void. Appeals for relief may be made to PAW district offices, or to Washington headquarters.

The forthcoming order will apply to all operators in every branch of the oil industry except marketers having less than five bulk plants, or having equipment valued new at less than $300 in each of 25 or fewer retail outlets owned or controlled by him.

Every operator is required to report within 7 days any changes in surplus inventory, whether by use, sale, or acquisition, and the entire surplus inventory report must be revised periodically.

Transactions between operators in the oil industry will be governed by price schedules of the Office of Price Administration.

Salt-Water-Disposal Facilities Expanded

KILGORE, Tex.—The East Texas Salt Water Co. has announced the construction of additional salt-water-disposal systems in the area southwest of Kilgore in the Chism, Holmes and Ryan surveys and the area south and west of Gladewater in the Chote, Dillard and Hokit surveys.

The company has already constructed a concrete gunite salt-water-collection pit in the Dorcas Wills lease of the Selby Oil & Gas Co. The injection well is now being drilled and is located in the P. W. Holmes Survey, west of the limits of oil production on Southern and Thurmond's A. A. King lease.

Cushing Refinery Sold to Midland Cooperative

CUSHING, Okla.—Negotiations are expected to be comsummated this week for the sale of Cushing Refining & Gasoline Co., which operates a 5,000-bbl. refinery here, to Midland Cooperative Wholesale of Minneapolis, Minn. Operation of the plant will be continued without interruption as the Cushing Refining & Gasoline division of the Midland Cooperative company.

Rex H. Winget, vice president and general manager of Cushing Refining & Gasoline Co., has contracted to remain with the operating organization in his present capacity for 3 years.

Midland Cooperative handles supplies for 250 separate cooperative local distribution points in Minnesota and is one of the large marketers in that territory. Cushing's participation in the products line affording its refinery a connection with the Great Lakes Pipe Line Co., which in turn makes delivery of gasoline at Minneapolis and intervening marketing centers.

No changes are contemplated in the Cushing personnel, Mr. Winget said.

Organizational Planning Staff Created by PAW

WASHINGTON, D. C.—An organizational planning staff has been created in the Petroleum Administration for War, with Lounsbury S. Fish in charge as director.

The staff will advise and assist Administrator Ickes and Deputy Administrator Davies in developing and maintaining a plan of organization through which the activities of PAW can be most effectively directed, coordinated, and controlled.

TABLE 1.—OPA Ceilings on California Crude Oil in Specified Fields*

A.P.I. gravity—	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
8-8.9	...	...	$.71	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9-9.9	...	...	.73	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10-10.9	...	...	.75	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11-11.9	...	$.92	.77	$.92	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12-12.9	...	.94	.79	.94	...	...	$.94	...	...	...	...	...	...	...	...	...	...	...	...	...
13-13.9	...	.96	.81	.96	...	...	.96	...	...	...	...	...	...	...	...	...	...	...	$.91	...
14-14.9	$.98	.98	.83	.98	$.98	$.95	.98	...	$.98	$.96	...	...	$.97	$.97	$.95	$.95	$.95	...	.93	...
15-15.9	.98	.98	.85	.98	.98	.95	.98	$.94	.98	1.00	1.01	$.94	.97	.97	.97	.96	.97	$.93	.96	$1.01
16-16.9	.98	.98	.85	.98	.98	.95	.98	.94	.98	1.00	1.01	.94	.97	.97	.97	.96	.97	.93	.96	1.01
17-17.9	.98	.98	.85	.98	.98	.95	.98	.94	.98	1.00	1.01	.94	.97	.97	.97	.96	.97	.93	.96	1.01
18-18.9	.98	.98	...	.98	.98	.95	.98	.94	.98	1.00	1.01	.94	.97	.97	.97	.96	.97	.93	.96	1.01
19-19.9	.98	.98	...	.98	.98	.95	.98	.94	.98	1.00	1.01	.94	.97	.97	.97	.96	.97	.93	.96	1.01
20-20.9	.98	.98	...	.98	.98	.95	.98	.94	.98	1.00	1.01	.94	.97	.97	.97	.96	.97	.93	.96	1.01
21-21.9	.98	.98	...	.98	.98	.95	.98	.94	.98	1.00	1.01	.94	.97	.97	.97	.96	.97	.93	.96	1.01
22-22.9	.98	.98	...	.98	.98	.95	.98	.94	.98	1.00	1.01	.94	.97	.97	.97	.96	.97	...	...	...
23-23.9	.98	...	...	.98	.98	.95	.98	.94	...	...	1.01	.94	.97	...	.97	...	...	...	...	...
24-24.9	.98	...	...	.98	...	.95	.98	...	...	...	...	.94	.97	...	...	...	...	...	...	...
25-25.9	.98	...	...	.98	...	.95	.98	...	...	...	...	.94	...	...	...	...	...	...	...	...
26-26.9	.98	...	...	...	...	.95	.98	...	...	...	...	.94	...	...	...	...	...	...	...	...
27-27.9	...	...	...	...	...	...	.98	...	...	...	...	...	...	...	...	...	...	...	...	...

*Fields—(1) Edison, Mountain View; (2) Midway, Lake View area, Elk Hills, Buena Vista Hills; (3) Los Flores, Casmalia, Oxnard, Cat Canyon, Santa Maria Valley, Gato Ridge; (4) Round Mountain, McKittrick, Newhall, Coffee Canyon, Mount Poso, Poso, Kern River, Kern Front, Fruitvale; (5) Belridge, Lost Hills; (6) Capitan, South Mountain, Santa Paula; (7) Coalinga; (8) Venice, Playa Del Rey; (9) Orcutt; (10) Huntington Beach; (11) Inglewood; (12) Alison Canyon; (13) Montebello; (14) Olinda, Brea Canon; (15) Torrance; (16) Richfield; (17) La Habra, Whittier, East Coyote; (18) Signal Hill; (19) Wilmington; (20) El Segundo.

Ceiling Prices Raised on California Heavy Oils

(Continued from Page 12)

the receiving tank for California crude of the gravities specified in Table 1. Maximum prices for gravities above those specified in the table shall be determined under other provisions of Schedule 88.

The maximum prices, exclusive of taxes, f.o.b. refineries and tanker terminals for Pacific Standard 300 fuel oil having a viscosity of not less than 25 and not more than 60 seconds Saybolt Furol (at 122° F.) and of Pacific Standard 400 fuel oil having a viscosity of not less than 60 seconds Saybolt Furol (at 122° F.) when sold to consumers or refiners in bulk lots for delivery into barges, tank steamers, tank car, motor transport and pipe line shall be as follows:

Area—	P.S. fuel oil 300	400
Fresno County	$1.20	$1.10
Kings County	1.20	1.10
San Luis Obispo County*	1.20	1.10
Tulare County	1.20	1.10
Santa Barbara County	1.20	1.10
Kern County	1.20	1.10
Ventura County	1.20	1.10
Los Angeles County	1.20	1.10
Orange County	1.20	1.10
Riverside County	1.20	1.10
San Bernardino County	1.20	1.10
San Francisco Bay area	1.25	1.15

*Maximum f.o.b. refinery and tanker-terminal prices at Port San Luis shall be the maximum prices established hereunder at the San Francisco Bay area.

Navy Grade special. — California, Washington and Oregon. A seller's maximum price for Navy Grade special fuel oil in the states of California, Washington and Oregon at a particular shipping or delivery point shall be the sum of his maximum price as determined by other provisions of this price schedule and $0.25 per barrel.

Large Crowd Assured at A.A.P.G. Meeting

THE American Association of Petroleum Geologists, the Society of Exploration Geophysicists and the Society of Economic Paleontologists and Mineralogists are holding a wartime conference at Fort Worth, Tex., on April 7, 8 and 9. This conference, which takes the place of the usual annual meetings will be held at the Texas Hotel. The executive committees of the associations and the local committee in charge of the program have already put out the S.R.O. sign with an announcement that all the available hotel accommodation has been booked for some weeks in both Fort Worth and Dallas and have recommended that those who do not already have reservations do not attempt to attend the meetings.

Schedule of Events

Tuesday, April 6

Afternoon

1:30—A.A.P.G. Executive Committee.

Wednesday, April 7

9:30-11—S.E.P.M. Technical Session.

9:30-12:30—S.E.G. Technical Session.

All morning: Business Committee Meetings.

Afternoon

2-5—S.E.P.M. Technical Session.

S.E.G. Technical Session.

A.A.P.G. Business Committee.

Research Committee Conference Group.

Thursday, April 8

8-9—A.A.P.G. Geologic Names Committee, J. G. Bartram, chairman.

9-10—A.A.P.G. Business Meeting, Nomination of Officers, F. L. Aurin, chairman.

10-12:30—Joint Technical Session. Presidental addresses, personnel and war problems, surveys and reviews of 1942 activities. Speakers: F. M. Van Tuyl, F. H. Lahee, K. C. Heald, Herschel L. Driver, Frank Goldstone.

2-5—Joint Technical Session.

Speakers: F. L. Aurin, R. J. Gonzalez, E. DeGolyer, L. F. McCollum, W. B. Heroy.

Evening

8-9—Address by Claude E. ZoBell, Scripps Institution of Oceanography, La Jolla, California. Bacteria as Geological Agents, with Particular Reference to Petroleum.

9-11:30—Smoker given by Fort Worth Geological Society.

Friday, April 9

9—A.A.P.G. Distinguished Lecture Committee, J. L. Ferguson, chairman.

9-12:30—S.E.G. Technical Session.

9:30—A.A.P.G. Symposium on Secondary Recovery and Stripper Wells, with particular reference to geological factors. Speakers. Paul D. Torrey, C. P. McGaha, George R. Elliott, R. C. Earlougher, George H. Fancher, Paul E. Fitzgerald.

Afternoon

2-4—Joint Session. Symposium on Favorable Areas for Wildcatting for War Needs. Speakers:

Max L. Krueger, Pacific Coast States;

C. E. Dobbin, Rocky Mountain States;

J. V. Howell, North Mid-Continent and Eastern Region;

O. L. Brace, Gulf Coast and South Mid-Continent.

4-5—A.A.P.G. Annual Business Meeting, F. L. Aurin, chairman. Reports of officers and committees. Announcement of election of officers.

Corrosion Problems Discussed at Pipe-Line Engineers Conference

by Paul Reed

ST. LOUIS, Mo.—In the wide range of subjects presented at the fifth Bureau of Standards Soil Corrosion Conference at the Statler Hotel here, March 25-27, much time was given to discussing methods for increasing the effectiveness and lowering the costs of cathodic protection as well as to the fundamental theoretical concepts. The conference was called and presided over by K. H. Logan, chief, Underground Corrosion Section, National Bureau of Standards.

This is the first conference on the subject since 1937. An unusual practice is followed at these gatherings which has proved to be successful in providing opportunity for active comment. Admission to the sessions was limited to those contributing papers or those representing organizations which did so. However, all of those engaged in the advancement of work for combating corrosion were invited on these terms. Copies of papers were furnished in advance and none was read at the meetings; neither did the author present a summary. Presiding over each session was an engineer who was not necessarily a specialist in the particular branch of corrosion being considered. After reading to the group a brief summary of each paper, the chairman called for discussion which was frequently lively. For the conference was attended by men from all parts of the country who are studying corrosion problems as they affect communications systems, utilities, pipe lines and other underground structures. More than 50 men attended and a still larger number of papers were prepared for the occasion.

Foremost in the discussion were subjects dealing with the adequacy of cathodic protection, anaerobic corrosion and improved methods for locating areas, in advance of pipe laying or afterward, which require cathodic protection.

Much attention was given to measurements of cathodic polarization and problems of interference on underground structures which are important in methods for determining the extent of cathodic protection. Because of the practical value of "pipe to soil" potentials, a test method was presented for disclosing the nature of corrosion of buried pipe. Determination of power required for cathodic protection was discussed.

Since microbiological-anaerobic corrosion is probably the most recent significant problem to be studied by corrosion investigators in this country, much attention was given to the influence of sporovibro desulficans on current and potential behaviors on corroding iron as well as to the subject of corrosion of iron by biological oxidation of sulfur and sulfides.

In dealing with the effect of aeration on the hydrogen ion concentration of an anaerobic soil it was stated that the Bureau of Standards has discovered that some of the values of pH did not represent field conditions of soil in its natural state.

Attention was given to such subjects as the difficulties of determining current density in applying cathodic protection; location and spacing of galvanic rods; practical design and economics of a cathodic unit in a refinery, carbon anodes in an electrical drainage system; corrosion coupons and pipe-line predictions; magnesium anodes and cathodic protection; fouling organisms in salt water; analysis of soil-corrosion data on corrosion resistant materials, and rust on ferrous metals as a retarder of corrosion.

Emphasis was placed on the satisfactory results obtained by coordination of practices applied by organizations operating in an area where each is concerned with cathodic protection. Where methods have been established providing for intercompany cooperation money is saved and better protection is insured.

Attending the corrosion conference were these pipe-line engineers: F. J. McElhatton, Panhandle Eastern Pipe Line Co.; J. M. Pearson, Susquehanna Pipe Line Co., W. F. Rogers, Gulf Oil Corp.; L. F. Scherer, War Emergency Pipelines, Inc. (Texas Pipe Line Co.); O. C. Mudd, Shell Pipe Line Corp., and K. H. Logan, chief of the underground-corrosion section of the National Bureau of Standards

Robinson Resigns as PAW Assistant Refining Chief

WASHINGTON, D. C.—Philip M. Robinson has resigned as assistant director of refining of PAW for reasons of health and will take an extended vacation at his home in Texas before returning to the oil industry. He formerly was with Pennzoil Co. in Oil City, Pa., before joining the Petroleum Administration in December 1940.

Refiners Hear Report on Aviation Gasoline

(Continued from Page 19)

power shortage is acute. He said that in the Richmond (San Francisco Bay area) refining center, plant employment was 20 per cent women. These women are being used not only in the offices and in laboratories but also are being trained for plant operating work. Most plants in California are now on a 48-hour-week basis.

In connection with the discussion of manpower conditions which he predicted would become increasingly critical in all parts of the refining industry, Mr. Brown explained the recent employment of Dr. Frederich H. Harbison as labor counselor of PAW. "This does not mean a manpower division for PAW has been created," Mr. Brown said, but will enable each operating division of the oil industry to have the advice of Dr. Harbison, an outstanding labor authority, in solving manpower difficulties.

Answering a question as to what refiners should do when key men are called for military service under the

Selective Service Act, Mr. Brown urged that refiners "not give up" in their efforts to secure deferment from local draft boards and appeal boards for those men who are essential in the operation of plants.

Replying to questions regarding the sources and quality of German lubricants, Mr. Brown referred to reports which indicate that the Germans are manufacturing high-grade lubricants synthetically. One method is to crack the large yield of wax obtained in the Fisher-Tropsch synthetic operation. The wax is then dehydrogenated and copolymerized. He also confirmed reports that Germany is partially relying on rich mixtures in securing maximum performance from its aviation-motor fuels.

Refining Program

Paul Blazer, president of the Ashland Oil & Refining Co., and chairman of the refinery committee for District 2 of PIWC, outlined the plan now being discussed and outlined covering the future emergency operations of refineries in District 2. "Washington can't solve this problem for us," Mr. Blazer said in urging refiners to give the committee full cooperation in working out the details of a workable program.

Every refiner will be given consideration in working out the operating plan for the district which hinges on crude supplies, yields of products, manufacture of war products, civilian requirements, transportation and distribution facilities, Mr. Blazer explained. He indicated that it might be necessary for some refiners to give up part of their crude-oil supplies although they are short of their immediate requirements at this time.

Transportation Situation

"The accomplishments in oil transportation under the Office of Defense Transportation are the outstanding achievement of the war period," Barney Majewski, chairman of the marketing committee for District 2, declared in commenting on the work of that office at the afternoon session which was devoted to transportation problems. Fayette B. Dow, Washington counsel of the association and director of the Petroleum Division of ODT; A. V. Bourque, associate director, and Samuel Niness, chief of the Petroleum Carrier Section of the Motor Transport Divisions of ODT, spoke and answered several questions relative to transportation problems.

Mr. Dow warned that the transportation difficulties of the oil industry will continue through this year. He said that with the completion of the "big inch" lines and the other smaller lines it would be possible to transport 720,000 bbl. daily of crude oil and products to District 1 by pipe line. The inland waterways will take care of an additional 180,000 bbl. daily. With East Coast demands including shipments to the war fronts in Europe and Africa to average around 1,600,000 bbl. daily, this will mean continued shipments by tank cars of 700,000 bbl. daily. Mr. Dow explained the rapidly increasing demands on the railroads for other war transportation as complicating the rail movement of petroleum in the future.

Mr. Bourque outlined the several problems in tank-car transportation that developed and have been solved starting in the summer of 1941 when the first demands came for increased rail shipments of crude oil and products to offset losses in ocean-tanker facilities. Mr. Niness explained the developments in the case of truck transportation which has largely supplemented tank cars in the short-haul movement of petroleum products. Some new tank cars and new tank-truck units have been authorized for 1943 as an aid in securing the maximum shipments through these facilities. It was stated that District 2 refiners had given up two-thirds of their tank cars in maintaining the large shipments of the past year from Districts 2 and 3 to District 1.

Following are the officers and directors of the association who will serve during the coming year:

Officers

President, C. L. Henderson, Vickers Petroleum Co.; vice presidents: R. W. McDowell, Mid-Continent Petroleum Corp.; *C. W. Cahoon, Jr., Olney Oil & Refining Co.; T. M. Martin, Lion Oil Refining Co.; H. E. Zoller, Derby Oil Co.; secretary, John C. Day; treasurer, Mary Sue Collins.

Board of Directors

President and vice presidents; H. T. Ashton, Socony-Vacuum Oil Co. (Lubrite); Paul G. Blazer, Ashland Oil & Refining Co.; Reid Brazell, Leonard Refineries, Inc.; H. W. Camp, Cities Service Oil Co.; Sheldon Clark, Sinclair Refining Co.; O. L. Cordell, Bareco Oil Co.; A. M. Hughes, Phillips Petroleum Co.; R. R. Irwin, Socony-Vacuum Oil Co. (White Eagle).

R. E. Luton, Ohio Oil Co.; F. L. Martin, Sunray Oil Co.; W. E. Moody, Deep Rock Corp.; I. A. O'Shaughnessy, Globe Oil & Refining Co.; L. H. Prichard, Anderson - Prichard Oil Corp.; K. R. Proctor, National Refining Co.

W. G. Skelly, Skelly Oil Co.; R. L. Tollett, Cosden Petroleum Corp.; J. W. Warner, Tide Water Associated Oil Co.; C. B. Watson, Pure Oil Co.; J. A. Welch, Arkansas Fuel Oil Co.; Rex H. Winget, Cushing Refining & Gasoline Co.

Ex Officio Directors: Roy B. Jones, Panhandle Refining Co.; L. B. Simmons, Rock Island Refining Co.

*Inactive. Serving in armed forces.

DEATHS

Max W. Babb, 68, chairman of the board of Allis-Chalmers Manufacturing Co., Milwaukee, Wis., died March 13 in Milwaukee, after an illness of several weeks. He had been board chairman since January 1942 and the company's president for the 10 years prior to that. In addition to his Allis-Chalmers activities, Mr. Babb had extensive connections elsewhere in the business and financial world.

William Lewis Kuhn, 77, died at his home in Oil City, Pa., last week. He had been ill for several months. He had been employed for 25 years by Carnegie Gas Co., retiring about 13 years ago. His widow survives.

William M. Spaulding, 60, oil producer of Bradford, Pa., died at Bradford last week, while en route to a hospital. Mr. Spaulding had been identified with the oil business since young manhood. He had lived in Bradford for 23 years.

Francis P. Gormley, 80, veteran oil operator and for 17 years a resident of Wichita Falls, Tex., died in a Wichita Falls hospital last week. Three daughters and four sons survive.

Samuel S. Reesman, 69, who entered the oil business in 1875, died at a Tulsa hospital last week, after a lengthy illness. His first job was as a pumper in the Pennsylvania fields, and he spent his entire life thereafter in the task of finding crude oil. Three daughters survive.

Eugene Arnold Reilly, 66, owner of Trapshooter Reilly Oil & Royalties Co., died at San Antonio, Tex., last week.

Ellsworth D. Brown, 45, welding superintendent of Humble Pipe Line Co., Houston, Tex., died suddenly, March 25. He had been with Humble for 15 years. He leaves his wife, two sons and a daughter.

Edward T. Crooker, 70, retired employe of Ohio Fuel Gas Co., died last week. He had worked for the company for 25 years before retiring 5 years ago.

Walter J. Wooten, 23, who moved to Fort Stockton, Tex., from Odessa, Tex., a month ago, was crushed to death last week in an oil-drilling accident. His widow and two children survive.

Thomas Walter McGuire, 61, employe of Tide Water Associated Oil Co., died at his home in Sapulpa, Okla., last week. Mr. McGuire entered the oil business in Pennsylvania and followed oil development through Ohio and into Oklahoma. In 1932 he was made district foreman for Tide Water, retiring in 1940.

Salt-Water Disposal in Kansas

Many fields dependent upon wells for this purpose, which fact presents a number of unusual problems

by Neil Williams

MANY fields and wells of western Kansas have reached a stage that water constitutes a large proportion of the production (The Oil and Gas Journal, March 18, 1943, p. 41). Most wells that have been completed as long as 2 years will make as much as 50 per cent water. It is not uncommon in the older fields for wells to make 90 to 95 per cent. Generally, it is possible to produce a well up to 98 to 99 per cent water before it reaches its economic limit. Consequently, water disposal has become one of the most important phases of operation in the district.

In these fields producers are now practically dependent upon wells for disposal of the water. There are no suitable streams into which appreciable quantities of salt water might otherwise be released safely. During early development impounding of the water in earthen reservoirs for evaporation was resorted to in some instances but this has proved inadequate and unsatisfactory, and resulted in much trouble due to seepages and frequent breaks in dikes. State regulations now prohibit impounding of water or other disposal except in wells.

Disposal of water in wells has presented a number of problems, both physical and economic. Not only has it been necessary to provide wells capable of taking the water in sufficient volume but special precautions have been necessary to insure that injected water would not enter any formation in which fresh-water supplies or oil production would be endangered. Also involved has been the adoption of suitable methods and facilities for handling and treating the water. Chief concern, in view of the comparatively low potential oil recovery remaining in some of these fields, has been the need for holding costs of disposal to an absolute minimum.

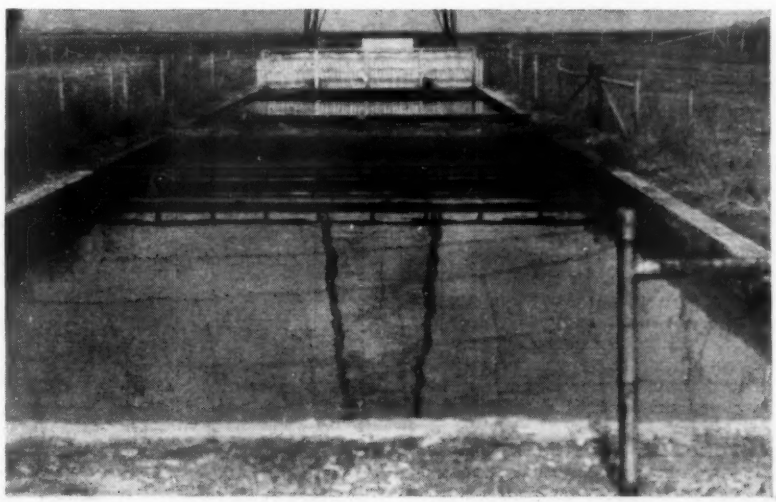
Principal formations used at this time for water injection are the Arbuckle lime, the granite wash and the Reagan sand, which lies below the Arbuckle. The Dakota sand has been used to some extent in certain areas but this is a shallow horizon and sometimes is a source of fresh-water supply. A survey now is under way to determine the extent of potentialities of this sand for water disposal. The Arbuckle lime, usually found around 3,250 ft., is the main oil-producing horizon of the area, but it has a very active water drive and is a large producer of water, and with water returned to downstructure locations no complications arise. The Reagan sand is a particularly suitable sand in those fields where it is known not to carry oil or gas. Although various shallow sands have been used, injection to them rapidly is being discontinued in favor of the lower horizons.

Take Water Readily

As a rule, these formations take water readily although in them are tight sections in which a disposal might encounter trouble. In such cases it sometimes is necessary to relocate the well. When a well will take water, it usually will do so by gravity and in sufficient volume that the need of pumping is eliminated. Frequently, single wells handle as much as 400 to 500 bbl. of salt water daily, and sometimes many times that much. In some wells the total volume of water which can be handled is seemingly unlimited. One disposal system in the Silica field, Rice and Barton counties, has taken 13,500,000 bbl. of water in the last 5 years; another in the same field has disposed of 8,000,000 bbl. in 2 years; and a third in the Chase field, Rice County, has taken 11,200,000 bbl. in 4 years.

When available, old wells which have been or are about to be abandoned generally are used for disposal

Typical settling pit on concrete construction in a western Kansas field. This pit has three baffles. Water flows by gravity into well barely visible in background



systems. Although ordinarily not as effective as a new well drilled and completed especially for the purpose, costs of disposal systems are materially reduced in this way. Unless the well is shared by a group of operators or handles the water from a large number of wells the cost of a complete new well usually is not justified. For conversion of an old well, it usually is necessary to deepen the old hole, underream it and acidize.

Corrosion is a major source of trouble in handling the water. Water produced from the Arbuckle lime, the main producing horizon, has a high sulfur and hydrogen sulfide content, which acts rapidly on all metal with which it comes in contact. This has led to the almost general use of cement-lined tubing in disposal wells. In many instances, however, only the bottom part of the string up to a point above which the water is likely to stand is protected. Corrosion in the upper section of the tubing usually is not so great, and also replacements can be made in that portion without having to pull the entire string. Conventional practice is to set the tubing with packer at the casing seat near the bottom, keeping the water from behind the tubing and minimizing the chance of corrosion to the casing and outside of the tubing string.

Because of corrosion, asbestos-cement pipe is used almost exclusively for all lines carrying water, both in gathering systems and at disposal plants. Some companies have devised fittings and other connections made of cement. Whenever metal tanks are used for accumulating reservoirs, these must be lined with some protective coating. Generally, settling pits are constructed of concrete.

Sundry types of systems for handling and preparing the water for injection have been and still are employed. These represent a transition of ideas of what constitutes the most adaptable methods. Original installations were largely of the closed types, designed with a view toward keeping the water from contact with the air. Later, operators turned more to the open type of systems with provision for obtaining prolonged exposure to the air. These included extensive settling pits with sprays and other means of aeration of the water with a view toward obtaining the maximum separation and precipitation of chlorides and sulfates. More recently there has been a swing back to closed systems.

Semiclosed-Type Systems

Closed systems now in vogue are more of a semiclosed type which depend on having a thick covering of oil and sludge over the surface of the water in the pits to prevent contact of air with the water. Pits themselves in most instances are open and usually are of simple construction, having only a series of baffles to retard the flow of brine. Previously, operators have sought to trap most of the sludge and drain it off, and also to precipitate as much of the chlorides and sulfates as possible into the pits Now it is considered desirable to permit accumulations of sludge over all open water throughout the entire pit system, and also to allow the chlorides and sulfates to remain in the water.

Special treatment of the water, either chemically or electrically, usually is not undertaken. Some of the earlier and more elaborate systems contained provisions for this, but most of these have been discontinued. Operators, under the circumstances, now prefer to allow the sludge to accumulate in the well, and then if the well becomes clogged go in and clean it out and reacidize. It has been found that the sludge accumulations usually are not serious enough in these cases to justify the extra cost of installation and operation of special treating facilities. While some wells require frequent cleaning out and reacidizing, others are able to take water continuously for several years at a time without cleaning out.

Construction of Settling Pits

Most of the concrete salt-water settling pits are from 20 to 30 ft. wide, from 50 to 70 ft. long, and from 6 to 8 ft. deep, with two or three dividing baffles. The water gravitates successively through the divided pits and directly to the well, usually immediately adjacent to the pits. In some of the systems, use has been made of old steel tanks, partly cut down and protected on the inside with special corrosion-resisting paint or other preparation. Outlets are equipped with float control valves which maintain a more or less uniform water level in the pits or tanks, regulating the rate of flow to the wells.

Various ownership and operation arrangements are made designed to reduce the cost of water disposal for the individual operators. In several fields community owned and operated systems have been provided, although in most fields the individual operators have their own systems or arrange with a neighboring operator to handle the water on a cost basis.

Left: Inside a 55,000-bbl. tank used as a salt-water accumulation reservoir showing water inlet line. Effects of corrosion can be noted on the line

Below: Salt-water accumulation in a western Kansas field using the bottom ring of a 35,000-bbl. steel tank. Disposal well is shown at right

Practical Refining Series—Part 6

Operating Multidraw Fractionating Towers

by W. L. Nelson

In order to clear up confusion in the minds of some operators as to how to operate this, the most common major equipment used in petroleum refineries, the author presents a list of seven rules which make clear the most frequently presented problems. Each of the seven rules is discussed briefly.

ALTHOUGH multidraw fractionating towers are the most common major equipment used in petroleum refineries, there is some confusion among plant operators as to just how to operate them.

In Fig. 1 is shown the distillation curve of a typical Mid-Continent crude oil and the amounts of gasoline, kerosene, distillate, etc., contained in it. In addition, the (equilibrium) vaporization curve is shown: this curve relates the amount vaporized to the temperature that is required at the feed plate of the tower. Thus, for a temperature of 605° F. at the feed plate to the tower (or about 670° F. at the pipe still outlet), the percentage vaporized will be 58 per cent.

In Fig. 2 is shown a fractionating tower and strippers for separating the above products. More than the normal number of trays are shown so that the withdrawal of products can be accomplished in many different ways. Steam strippers are shown for each of the sidedraw products, and in addition the topped crude oil is stripped with steam in the lowest six trays of the tower.

In the operation of such a tower system there are certain rules or principals of operation which are listed and discussed in the rest of this paper.

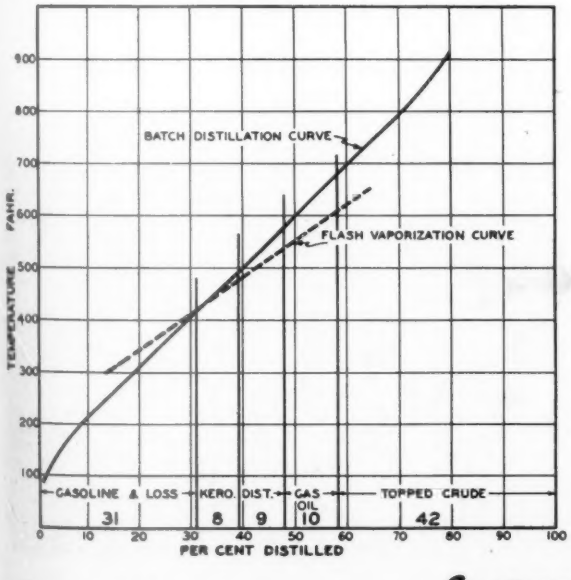
1. **Only the amount vaporized can be withdrawn above the feed plate.**—In this instance only 58 per cent of gasoline, kerosene, distillate and gas oil can be withdrawn. This is so obvious a statement that it may appear to be foolish—but in actuality, since the operator cannot easily know exactly how much is being vaporized, the situation may be very confusing. The remedy is to raise the feedplate temperature, taking care that no large excess temperature is employed because a high temperature results in an overloaded tower, and has little advantage except to induce somewhat better fractionation in the lowest or gas-oil fraction.

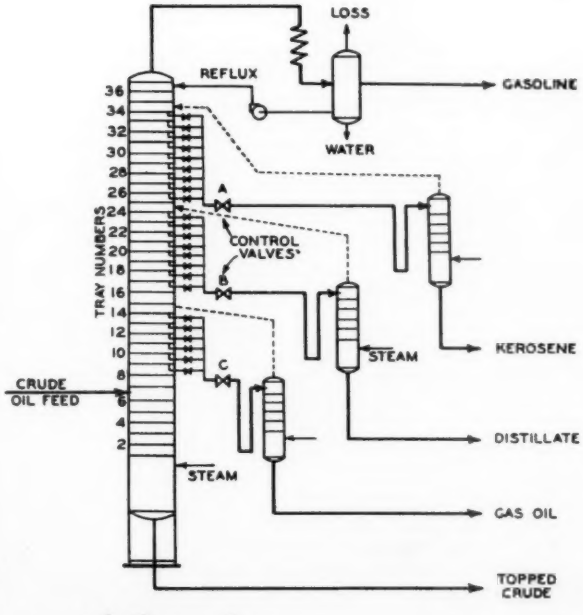
2. **Top temperature regulates amount of gasoline.**—The gasoline (or top product) is the only product that is withdrawn as a vapor and the temperature at the top of the tower (dependent on amount of reflux) is the only means of regulating the amount of top product (except to change the pressure). Thus, a top temperature of about 300° F. (at 4 lb. gage pressure) will produce the 31 per cent of gasoline, whereas a temperature of 290° F. would produce 29 per cent of gasoline having an end point of about 375° F. rather than the 31 per cent of 390° F. end-point gasoline. The top temperature does not directly regulate the degree of fractionation: fractionation being dependent on the number of trays between the top and kerosene draw plate as indicated in Rule 6 below.

3. **Opening valve increases product.**—Opening the side-draw valve increases the yield of that product. Thus, if control valve A in Fig. 2 is opened, the yield of kerosene increases but at the same time it is necessary to close the distillate

(Continued on Page 38)

Fig. 1 (below): Typical Mid-Continent crude oil. Fig. 2 (right): Topping tower with steam strippers





Texas City pump station from pump side showing open-wall construction and manifold hookup in foreground. Two small tanks at extreme left are "dye pots" for coloring gasoline pumped through station

Pipe-Line Pump Station Built With Minimum Use of Critical Materials

THE new terminal pump station at Texas City, Tex., and the additional booster station at Henderson which Pan American Pipe Line Co. has placed in operation in connection with the conversion of its East Texas-Gulf Coast 12-in. line from southbound crude to northbound products movement were built with expenditure of a minimum amount of new and critical materials. Second-hand materials were used when available. Equipment intended and used for other purposes was installed and adapted to pipe-line pump-station needs when regular facilities were not easily obtainable. Mechanical ingenuity was applied, however, in designing the stations to provide the necessary safety factors and the most effective utilization of the equipment and materials at hand.

In the terminal station at Texas City, pumps consist of four 14-in.-stroke oil-field drilling-mud pumps. While these are much heavier than the job required, regular pipe-line-station pumping equipment, either reciprocating or centrifugal pumps, was not obtainable when needed. In adaptation of the mud pumps to this service, the 7-in. pistons and liners, which were in the pumps, were replaced with 5½-in. pistons and liners. Also, the smallest pistons were equipped with steel rings instead of

Engine room of Texas City pump station showing V-belt drives to pumps on opposite side of fire wall. Safety guards have been installed on V-belts since picture was taken. Auxiliary and tool room is at extreme left

XUM

the rubber wipers ordinarily used on pistons in mud pumps. Bronze valves with steel seats were substituted for the standard valves, and the air chambers were removed. Strokes of the pumps were unchanged.

Refitted, the pumps were tested for an operating pressure of 4,500 lb., although the operating pressure of the converted pipe line is around 800 lb. The pumps provide a station capacity of approximately 34,000 bbl. of refined products daily. Each of the pumps was fitted with a small injection pump, operated by an eccentric on the pinion shaft, for injection of dye, if desired, into the gasoline moved through the line. The dye is injected into suction of each pump.

Each pump is powered by a 220-hp. automotive-type gas engine. All engines have identical bores, strokes and speeds. The drives are by means of V-belts, operating through a special fire wall which separates engines and pumps. Belts on the pump side are enclosed in a solid metal housing which covers the openings through the fire wall through which the belts operate and fits snugly around the pump drive-shaft housings, preventing any air circulation between the engine and pump rooms. On the engine side only safety guards are needed.

Saving in steel, the framework of the station building is wood. A truss and sawtooth design of roof construction was adopted not only to avoid the need of steel framework but also to provide a satisfactory coverage and adequate ventilation for the pumps and engines. This type of roof construction also permits a continuous and tight fire-wall installation between the engine and pump rooms extending to the top. Louvres in the face of the sawtooth roof provide the top ventilation for the engines, located directly underneath. To permit most effective utilization of what lumber was available, the building was erected in segments.

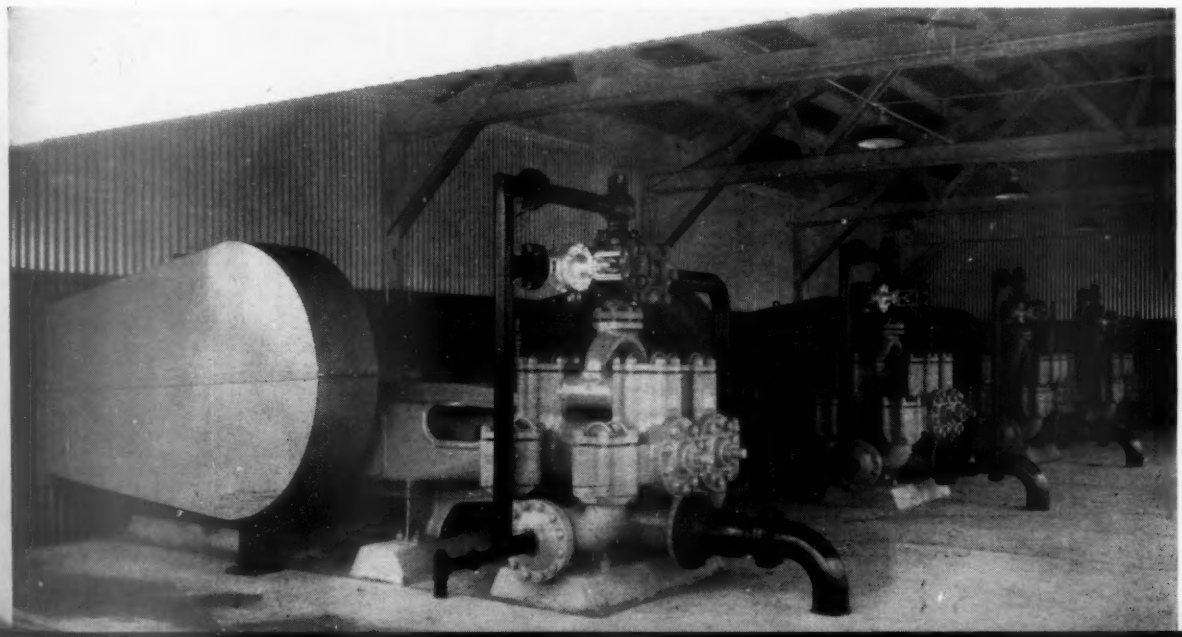
Front of Texas City pump station building showing truss and sawtooth type of roof construction. Office room is at left with auxiliary and tool room at right

The building contains in addition to the engine and pump rooms, which are separated by the continuous fire wall, a small office room and an auxiliary room for tools and supplies. The engine and pump rooms are of open-type construction, having no outside walls. This is a type housing frequently provided on the Gulf Coast where severe cold weather is not usually experienced. The open rooms insure complete ventilation and prevention of possibility of any gas accumulations.

The station is the most southerly terminal not only for the company's own line, extending 224 miles to Longview, East Texas, where it ties into the WEP 24-in. line to the East, but also for the Bayou Pipe Line Co.'s system, which extends to Baton Rouge, La., where it ties into Plantation Pipe Line Co.'s products line to the East Coast. The discharge can be pumped to either or both systems by valve changes in the station's manifold hookup. The manifold also is crossconnected with the pump suction and discharge of the station's No. 1 unit, permitting reversed pumping on all lines.

Pumping facilities at the Henderson booster station consists of two 250-hp., three-stage, motor-driven centrifugal pumps capable of delivering 50,000 bbl. of products daily at 400 lb. pressure. This equipment, including valves and fittings, also is secondhand. The building is of wooden construction, covered with iron, and contains a small office and pump room.

Pump room of Texas City pump station using mud-hogs converted from oil-field drilling service. Metal housing over V-belts cover openings in fire wall and prevent circulation of air between pump and engine rooms. Built-up truss construction of roof is shown



Some Uses of Infra-Red Spectroscopy For Hydrocarbon Analysis

by R. Robert Brattain *

Infra-red spectroscopic analysis of hydrocarbon mixtures is a new principle of determination of the individual components of charge stocks and products fast becoming indispensable to present-day operations of alkylation, isomerization, catalytic cracking processes. This author shows the analytical methods, calculations, degrees of accuracy and applications.

ANY spectroscopic analytical procedure depends, from the simple standpoint, on finding a spectral position where only one of the components of a mixture absorbs strongly. However, the same absorption band may not serve to determine a particular component in two different mixtures. Consequently, the greatest simplicity and rapidity for routine analysis is achieved only when the analytical procedure is based on a detailed study of the specific mixture to be analyzed. This point is well illustrated by the analysis of butane mixtures which contain small amounts of propane and pentanes. If check analyses show that the amounts of propane and pentane remain below certain limits, a procedure which considers only the presence of the two butanes will serve to control an isomerization unit.

Regardless of the necessity of fitting the procedure to the mixture, certain general requirements can be stated for a spectroscopic analytical method which is to be used for routine analysis and plant control. The method should:

1. Be as rapid as is consistent with the precision required.

2. Yield the actual analysis from the experimental readings with a minimum of calculation.

3. Require only a simple procedure performed with a consistent and sturdy apparatus.

*Shell Oil Co., Emeryville, Calif. Presented before the technical committee at the seventeenth annual meeting of the California Natural Gasoline Association at Los Angeles, Calif.

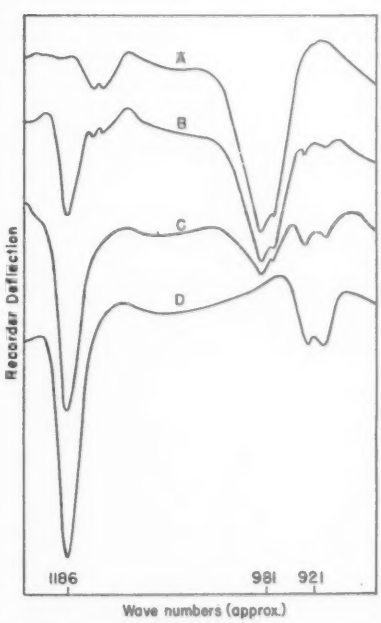


Fig. 1—Spectra of four samples containing different proportions of the butane isomers:

A—99.4 per cent n-butane
B—30 per cent isobutane
C—70 per cent isobutane
D—99.7 per cent isobutane

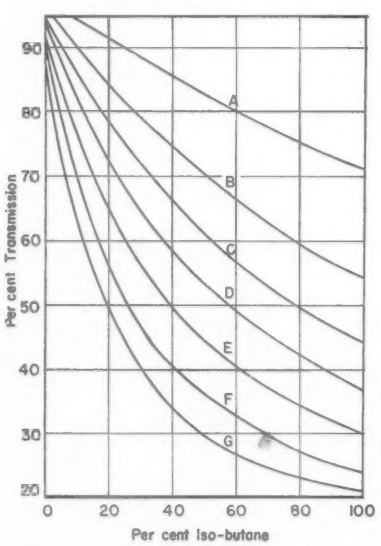


Fig. 2—Per cent transmission plotted against per cent isobutane for various pressures (in mm. of Hg.) of sample in a 15-cm. absorption path:

(A) 50 mm. (D) 200 mm.
(B) 100 mm. (E) 275 mm.
(C) 150 mm. (F) 375 mm.
(G) 475 mm.

Analysis on n-Butane-Isobutane Mixtures*

For a two-component sample, the above general requirements are fulfilled most easily by a system requiring only the determination of the per cent transmission at a single spectral position. With such a system, the largest change in per cent transmission per unit change in isobutane content is achieved by choosing the proper values of the three variables: spectral position, spectral slit-width and specific absorption path. The optimum values of these variables may change with changing isobutane content of the samples under investigation. However, a rapid routine analytical procedure must handle all samples with a minimum of adjustments for sample composition.

The spectra between the wave numbers 1250 and 870 of four different mixtures of the butane isomers are shown in Fig. 1. It is seen that large differences exist in this region between the spectra of these isomers.

The absorption band of isbutane at 1,186 cm.$^{-1}$ was chosen as the spectral position. This band is freest from interference due to n-butane and is closer to the energy maximum of the source than the other bands shown in Fig. 1. The absorption maximum of this band is used as the exact spectral position in the case of butane mixtures. However, in the case of another mixture a position on the side of an absorption band may give a larger change in per cent transmission per unit change of the unknown component. This situation could arise

*The discussion of two component mixtures was first presented before the American Physical Society, Pasadena, Calif., June 1941. (Phys. Rev. 60, 161, 1941) and was published by R. R. Brattain and O. Beeck, Jour. Appl. Physics, 13, 699 (1942).

if interfering absorption bands are present.

The spectral slit-width chosen for the analysis of isobutane in n-butane was about 65 cm.$^{-1}$. This value was selected to give the maximum energy strongly absorbed by isobutane in this spectral region.

Curves showing per cent transmission plotted against per cent isobutane for various gas pressures of the sample in a 15-cm. absorption cell are given in Fig. 2. From these data, Curve E (275-cm. pressure) was chosen as the most suitable over the entire 0 to 100 per cent isobutane range and Curve C (150-mm. pressure) was chosen as the best if the sample contains more than 70 per cent isobutane. Samples whose compositions were accurately known were used to obtain these curves.

To summarize, the routine infra-red analysis of n-butane-isobutane mixtures is made as follows:

The energy traversing the instrument and composed of the spectral interval from 1,217 to 1,153 cm.$^{-1}$, is read both with and without the sample in the light path. From these readings, the percentage of energy transmitted by the sample is calculated. The isobutane content (in per cent) is then read from a calibration curve. The calibration curve is plotted from readings taken on synthetic samples whose compositions are accurately known.

This system was used, at the Shell Development Laboratories, to analyze 5,500 samples in 22 months. In addition, two special instruments using this analysis procedure are now being used for plant control work. The accuracy of these routine analyses is about ±0.5 per cent of the total sample. The accuracy is slightly better for samples low in isobutane and slightly worse if the isobutane content is above 85 per cent. The time required for analysis is 20 minutes per sample. This figure includes time spent turning the instrument on and off, preparing the samples, calculating the results, periodically checking the method and making out analysis reports. It was arrived at by dividing the total time spent on these analyses by the total number (5,500) of samples analyzed.

The time is 15 minutes or less per sample if the number of analyses is sufficient to require 8 hours continuous work by an experienced operator. The average time per sample was increased to 20 minutes because six operators were trained within the 22 months with the spectrophotometer seldom in operation for more than 4 hours per day. One operator analyzed 38 samples in 6 hours, including calculations and other operations incidental to the actual analyses.

Accuracy Checks and Interference From Other Substances

The results of some of the checks of this infra-red method of analyzing butane mixtures are presented in Table 1. Three different bases of comparison are given:

1. Synthetic mixtures whose completions are accurately known.
2. Values obtained by low temperature distillation. The complete composition is given for these samples.
3. Duplicate spectroscopic values taken at least 1 day apart.

TABLE 1

Date analyzed—	Per cent isobutane by infra-red	Per cent isobutane synthetic	Per cent isobutane duplicate	Low-temperature distillate: Per cent isobutane	Per cent n-butane	Per cent propane	Per cent pentane
October 4, 1940	10.0	9.9	...	...	...	...	...
October 9, 1940	45.8	45.6	...	...	...	...	...
October 11, 1940	30.0	30.17	...	...	...	...	...
October 11, 1940	45.9	45.6	...	...	...	...	...
October 11, 1940	100.5	99.7	...	...	...	...	...
June 11, 1941	20.1	19.86	...	...	...	...	...
June 11, 1941	19.8	19.86	...	...	...	...	...
June 11, 1941	29.8	30.17	...	...	...	...	...
June 11, 1941	99.1	99.7	...	...	...	...	...
July 14, 1941	20.0	20.12	...	...	...	...	...
July 14, 1941	30.0	30.08	...	...	...	...	...
July 14, 1941	40.0	40.08	...	...	...	...	...
July 14, 1941	80.5	79.79	...	...	...	...	...
October 14, 1941	43.5	43.9	...	...	...	...	...
May 8, 1940	23.25	.....	..	22.6	75.6	0.0	1.8
	12.0	.....	..	11.2	88.4	0.0	0.4
	54.9	.....	..	54.9	43.7	0.2	1.2
May 16, 1940	36.9	.....	..	36.5	62.8	0.0	0.7
	16.0	.....	..	16.3	83.3	0.0	0.4
	61.0	.....	..	60.1	36.3	0.7	2.9
June 31, 1940	37.2	.....	..	36.5	62.5	0.1	0.9
July 22, 1940	37.4	.....	..	37.9	61.2	0.2	0.7
June 3, 1940	27.4	.....	27.7	...	...	...	...
June 10, 1940	48.4	.....	48.6	...	...	...	...
June 18, 1940	47.0	.....	47.5	...	...	...	...
June 11, 1940	22.2	.....	21.8	...	...	...	...

The accuracy of a low-temperature distillation analysis is about ±0.5 per cent.

Propane, n-pentane, and isopentane are the impurities most likely to be present in a n-butane-isobutane sample. All of these compounds have some absorption in the region of the 1,186 cm.$^{-1}$ isobutane absorption band. However, small quantities of these substances can be present without impairing the accuracy (0.5 per cent) of the above simple analytical method. The maximum allowable amounts are 10 per cent propane, 5 per cent n-pentane, and 2.5 per cent isopentane. Larger amounts of these impurities could be corrected by readings at other wave lengths. This is possible on the routine spectrophotometer which will be described later.

None of the unsaturated four-carbon compounds, butenes and butadiene, have large enough absorption at 1,186 mm.$^{-1}$ to cause small amounts of these compounds to interfere with this method of analyzing for isobutane.

Analysis of Mixtures of Butene-1 and Butene-2

The same system of analysis has been applied to mixtures of butene-1 and butene-2. The values of the three variables for this analysis are:

1. Spectral position — absorption maximum of the butene-1 band at 1,841 cm.$^{-1}$.
2. Spectral slit-width — about 65 cm.$^{-1}$.
3. Specific absorption path — 400 mm. pressure of gas in a 15 cm. cell.

About 250 such samples have been analyzed by this infra-red method. The accuracy and time per sample are the same as for butane mixtures.

Analysis for a Single Component in a Multicomponent Mixture

Determination of the amount of a particular component in a complicated mixture is sometimes possible using only a reading of the absorption at one spectral position. This situation usually exists when the component of interest is markedly different in structure from the rest of the components, which are similar in structure. A possible example of this would be the determination of a ketone in a mixture of benzene homologues. However, it should be emphasized that such an analysis would have to be developed as a particular case.

Analysis for All the Components in a Multicomponent Mixture*

A mixture of methane, ethane, ethylene, propane, and propylene will be used to illustrate the development of a procedure for the analysis of a multicomponent mixture by infra-red absorption. Analysis of this mixture has not been developed; however, it serves as a good example and should be of interest.

The time, involved in mixing standards and determining the curves to show the percentage of one component as a function of transmission at a particular position, is prohibitive when the percentage of the other

*A more detailed discussion of the analysis of multicomponent mixtures is being prepared for publication.

components can vary arbitrarily. Hence the following semitheoretical approach is used. For monochromatic radiation the transmission of a single component can be written:

$$\frac{I}{I_o} = e^{-acx} \qquad (1)$$

This expression is the familiar Beer's law, where I_o is the incident energy, I the transmitted energy, a the absorption coefficient, c the concentration and x the thickness of the absorbing layer. This expression can be put into the more familiar form:

$$\log_{10}\frac{I_o}{I} = \log_{10}\frac{I}{T} = Ecx \equiv D \qquad (2)$$

where E is the extinction coefficient and D is the optical density. From these fundamental expressions it follows that, for monochromatic radiation, the transmission of a mixture is equal to the product of the transmissions of the components. Or, in the phraseology of Equation 2 the optical density of a mixture is equal to the sum of the optical densities of the components. However, the transmission for a small wave length interval, and not monochromatic radiation, is actually measured. The transmission of a mixture then ceases to be a simple function of the transmissions of the components.

Nevertheless, under certain conditions, a simple relationship between the transmission of a mixture and the transmissions of the components can be used. These conditions are:

1. That it is possible to find a wave length interval, for each component, in which only this component absorbs strongly.

2. And that in this wave length interval only the extinction coefficient of this principal absorber changes rapidly.

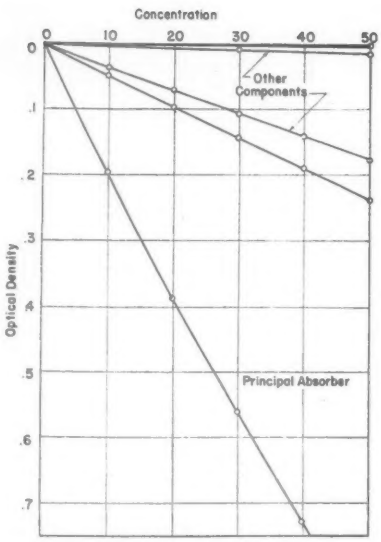


Fig. 4—Representative optical density—concentration graph for a five-component mixture of one spectral position

Under these conditions, it is assumed that the transmission of a mixture can be considered equal to the product of the transmissions of the components, to a sufficient accuracy for analysis of the mixture, despite the fact that the transmissions of the components are not given by Equation 1.

The significant parts of the spectra of methane, ethane, ethylene, propane, and propylene are shown superimposed in Fig. 3. On the basis of this figure, the spectral positions at which the transmission of the mixture would be determined and the principal absorber at each point are:

5.22μ — ethylene
6.05μ — propylene
7.68μ — methane
12.2μ — ethane
13.34μ — propane

In preparing for actual analysis of such a mixture the data represented by such a set of curves as Fig. 4 are determined for each one of the above spectral positions. Fig. 4 is a plot of the optical density against concentration in a constant length cell for each of the pure components. The unit of concentration used in this calibration chart is the concentration of gas represented by 1 mm. pressure at 25° C. As in the above simple case of butane mixtures, the spectral slit-width and the pressure (concentration) can be chosen so as to attain maximum analytical accuracy at each absorption position. Within the limits of usable energy traversing the spectrophotometer, this generally means narrow slit-widths and low pressures.

The actual analysis of such a five-component mixture would then be accomplished by determining the optical density of the mixture at the five selected spectral positions using the predetermined slit-widths and pressures. The concentration of each component is then determined by solving equations of the form:

$$D = d_1 + d_2 + d_3 + d_4 + d_5 \qquad (3)$$

This equation restates that the optical density of the mixture is equal to the sum of optical densities of the components. There is a similar equation for each spectral position—five in all. If the curves of optical density plotted against concentration (Fig. 4) are essentially straight lines, the concentrations of the components can be determined by simple linear equations derived from (3). If the above condition does not exist the concentrations can be determined by successive approximation. Although the latter system seems cumbersome, experience has shown that it can be completed in about 20 minutes for a five-component sample. The multicomponent analytical procedure should give an accuracy of about ±1.0 per cent using

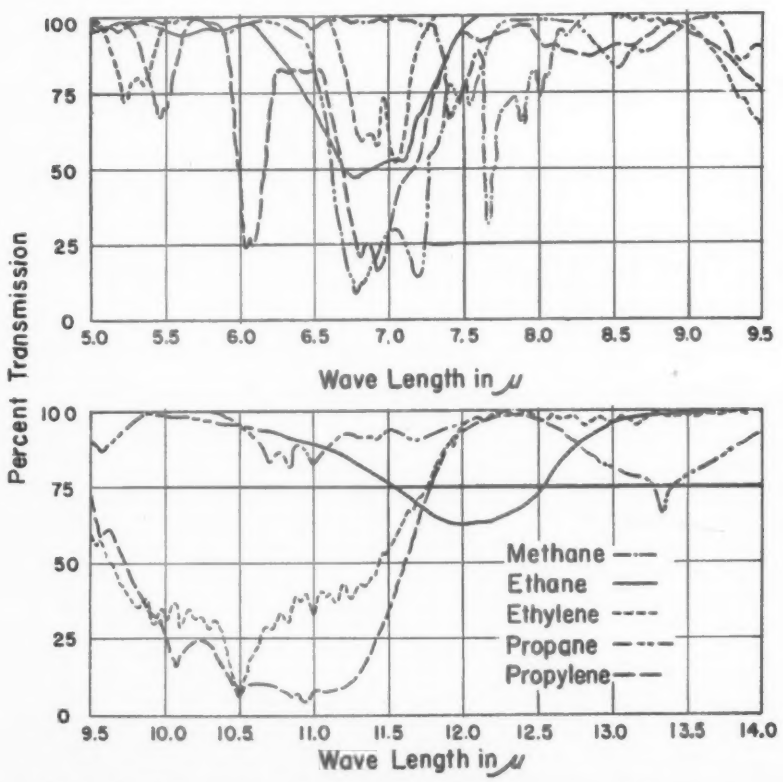


Fig. 3—Composite spectra of methane, ethane, ethylene, propane and propylene

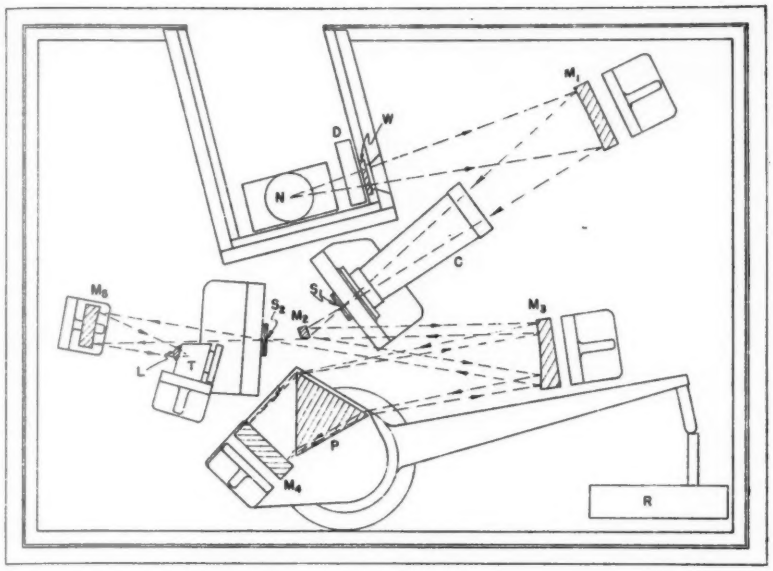


Fig. 5—Light-path diagram of routine infra-red spectrophotometer

the routine infra-red spectrophotometer described below.

Routine Spectrophotometer

As briefly mentioned earlier, the possibility of using infra-red spectroscopy as an analytical tool has long been recognized. The principal reason that development has been slow until recently is the difficulty of experimental technique in the infra-red. Briefly these difficulties arise from the necessity of using:

1. Prisms of sodium chloride, potassium bromide or lithium fluoride.
2. Thermopiles, radiometers, or bolometers as energy measuring devices instead of photographic plates.

These difficulties have been overcome by gradual refinement over a period of years, until now it is possible to build an infra-red spectrophotometer which can be used for routine analysis in a plant control laboratory.

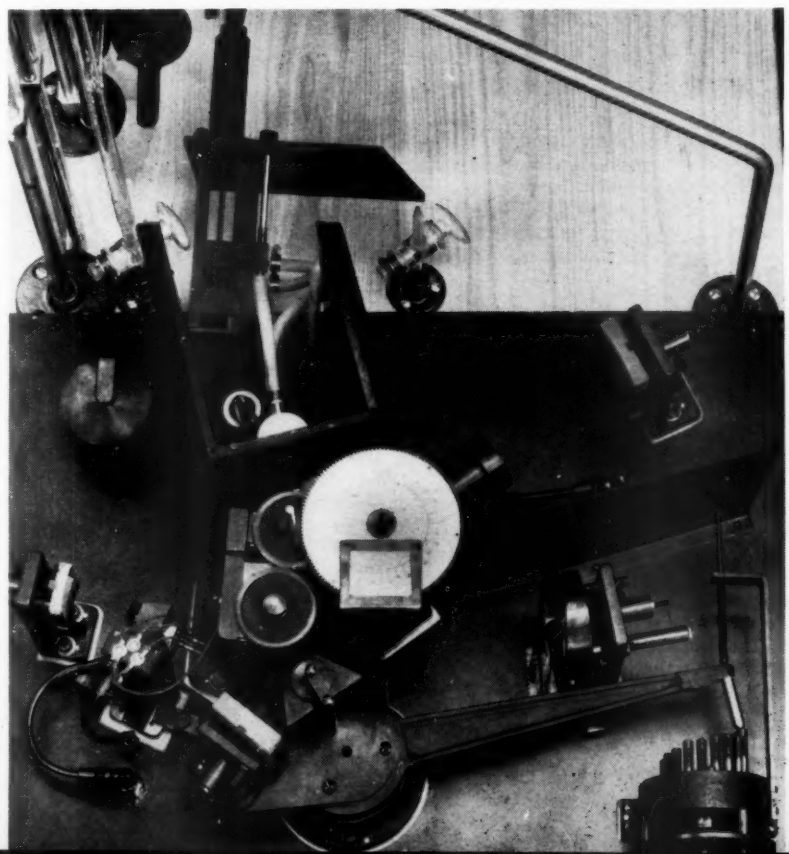
The instrument described here is the third model of an infra-red spectrophotometer which was designed particularly for routine analysis. The original development was carried on at the Shell Development Laboratories and this work is being used as the foundation of the improved instrument now manufactured by National Technical Laboratories of South Pasadena, Calif.

The light path and the arrangement of parts are shown in Fig. 5. The radiation from the Nernst glower source, N, enters the spectrophotometer case through the rock-salt window, W, and is focused by the spherical mirror M_1 at the first slit S_1. The sample cell, C, is attached to the frame of the first slit. The energy emerging from S_1 is reflected by the plane mirror M_2 onto the offaxis parabolic mirror M_3. M_3 is ground 14° off axis and has a diameter of 4 cm. and a focal length of 20 cm. Since part of M_3 is not filled by the beam from M_2 the aperture of the instrument is about F6. The parallel beam from M_3 traverses the 60° rock-salt prism P twice, being returned almost on itself by the plane mirror M_4. The refracting faces of the prism are 4 cm. high and 6 cm. long. The dispersed beam returning from P is focused by M_3 onto the second slit, S_2, forming a spectrum in this plane. The radiation coming through S_2 is concentrated onto the receiving junctions of the vacuum thermopile, T, by the spherical mirror M_5 and the rock-salt lens, L. The angular setting of the prism, and consequently the wave length of the radiation reaching the thermopile is controlled by the stop mechanism, R. This mechanism is a turret rotatable from outside the case, which carries hardened steel pins adjusted to give desired spectral positions.

A water-cooled metal shutter and a diaphragm for regulating the energy entering the spectrophotometer are located at D. A shutter of lithium fluoride, for use at the longer wave lengths, and a magnesium oxide filter for eliminating visible radiation can be placed in the beam between W and M_1. The slits (S_1 is curved) are the bilateral parallelogram type and are both adjustable by the same control outside of the case. The entrance window, the prism, and the cell windows are protected from normal atmospheric water vapor by a thin coating of polystyrene. This is of use mainly during adjustment as the air inside the gas-tight, insulated steel cover is dried during operation. All parts are bolted and doweled to a heavy cast-iron base plate 22 by 16 in. A view of the spectrophotometer is shown in Fig. 6. The differential expansion mechanism, which rotates the parabolic mirror to compensate for the change in refractive index of the prism with temperature, is visible on the back of the holder for M_3.

The parts of the special Nernst

Fig. 6—Routine infra-red spectrophotometer (cover removed)



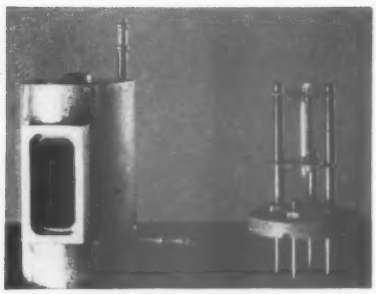


Fig. 7—Nernst glower radiation source

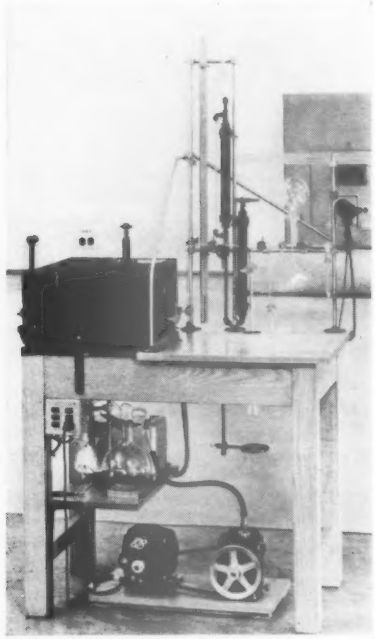


Fig. 8—Complete spectrophotometric analysis unit

glower source are shown in Fig. 7. The water jacket (6 cm. high) on the left is made from standard sizes of brass tubing. If the source is operated in a fire-restricted area, a rock-salt window is sealed into the recess in the flange. Under these conditions, the screw in the top can be removed periodically to replenish the air (oxygen) inside the jacket, which is necessary for maximum life of the glower. The right-hand view shows the Nernst glower and its starting heater assembled. The glower and the heater are located, with respect to the stainless steel studs, by the two mica washers. The studs are spaced in the heat-resistant insulating disk so that they fit a standard four-pronged base. This disk for holding the studs also serves as the bottom end of the jacket. The assembled lamp on its base block is shown in the general view of a spectrophotometer given in Fig. 6.

The ballast resistance, the transformer for the heater and a relay are in a separate box. The circuit is such

(Continued on Page 49)

Operating Multidraw Fractionating Towers

(Continued from Page 31)

and/or gas-oil valve (B or C) by a nearly corresponding amount. If valve B (or C) were not closed, Rule 1 would be violated in that we would be withdrawing not only the regular amounts of gasoline, distillate and gas oil (50 per cent) but also more than the 8 per cent of kerosene. Opening a side-draw valve increases the yield mainly by increasing the end point but to a minor extent also by the inclusion of some low-boiling material: producing a higher boiling range, lower vapor pressure, lower-gravity product.

4. **Closing side-draw valve decreases product.**—The product so produced has a lower end point, a higher gravity and vapor pressure, a lower boiling range, and obviously a lower yield. At the same time, the side-draw products withdrawn lower in the tower must be increased in amount by opening the side-draw valves.

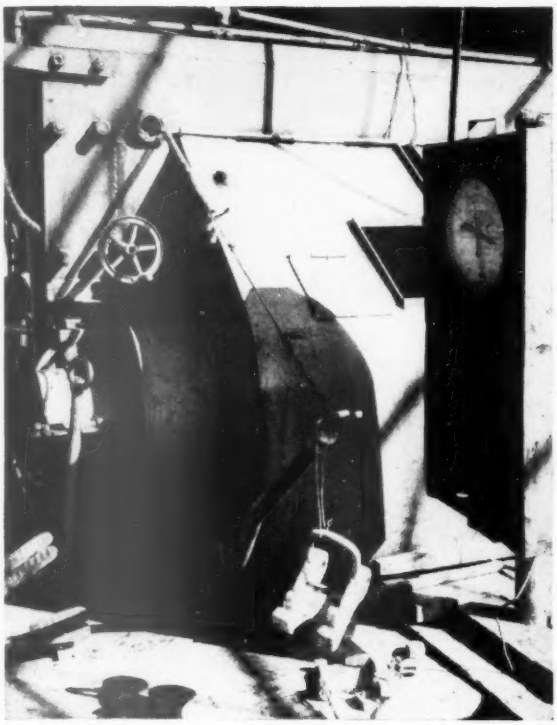
5. **Changing top temperature alters Rules 3 and 4.**—Both Rules 3 and 4 are altered by changing the top temperatures. This, opening of valve A may change the kerosene from 43° A.P.I. to 40° A.P.I. and raise slightly the flash point. This may be corrected by decreasing the top temperature, which increases the gravity and decreases the flash point of the kerosene. Both of these operations tend to increase the yield of kerosene, opening the side-draw valve A increases the end point, and decreasing the top temperature causes the condensation of low-boiling material which is withdrawn with the kerosene.

6. **Trays between products regulates fractionation.**—The amount that a side-draw valve is opened regulates the end point, but the end point can also be altered slightly by changing the number of trays between products. Kerosene would normally be withdrawn from tray 28 in Fig. 2, but if it were withdrawn from tray 32 (without changing the setting of valve A) the end point would decrease slightly without materially altering the yield. At the same time the initial boiling point (I.B.P.) will be decreased slightly (poorer fractionation) because of the inclusion of gasoline; this can be partially corrected by the use of additional steam in the stripper as indicated by Rule 7. Conversely, withdrawal of kerosene from tray 30 would result in a higher end point and a slightly higher I.B.P.

7. **Steam regulates initial boiling point.**—Although the number of trays between the product and the product withdrawn next above, has some effect on the I.B.P., the I.B.P. is mainly independent of the tray from which the product is withdrawn because in no way is it possible to escape the fact that gasoline (or top product) vapor is passing every tray (above the feed) in the tower. To some extent the gasoline vapor tends to be absorbed into each of the side-draw products and to lower the I.B.P. Thus, the amount that the control valve is open is the main control on end point and the amount of steam used is the main control for the I.B.P. Attempts to use large amounts of steam for increasing the boiling range of the main bulk of a side-draw product are not usually successful. The proper way to accomplish such a result is to open the control valve and close by a like amount the control valve of a lower side-draw control valve.

In connection with all of the above rules it should be noted that the composition of the products cannot be altered to the complete desire of the operator because the products must contain what is contained in the crude oil. No amount of manipulation can change this fact. Likewise, any change in the manner of withdrawing a product will result in changes in the products that are withdrawn lower in the tower. Finally, great patience is required. A change in the withdrawal rate of a product will not be completely reflected in the properties of the other tower products in less than several hours because the liquids on the trays that are affected (or the reflux accumulator) must be completely washed out before a settled operation can result.

Lastly, it **must be stressed** that high-boiling products are not necessarily withdrawn at low trays in the tower and, conversely, low-boiling products may be withdrawn low in the tower. If in Fig. 2, adequate draw-off connections were available, it would be possible to withdraw kerosene, distillate, and gas oil from trays 34, 31 and 28 respectively (all near top of tower) in the total amount of 58 per cent. The gasoline, kerosene and distillate would not be well-fractionated, but the end point of the gas oil would be excessively well fractionated. Likewise, these products could be withdrawn from trays 9, 11 and 14 (all near feed plate of tower) to the extent of 58 per cent, but only the gasoline and kerosene would be well separated, and even the end point of the kerosene would be high (poorly separated from distillate). In both of these changes the liquids on all of the trays in the middle of the tower would have to be displaced and hence it would take several hours before real kerosene, distillate, and gas oil would appear at the draw plates.



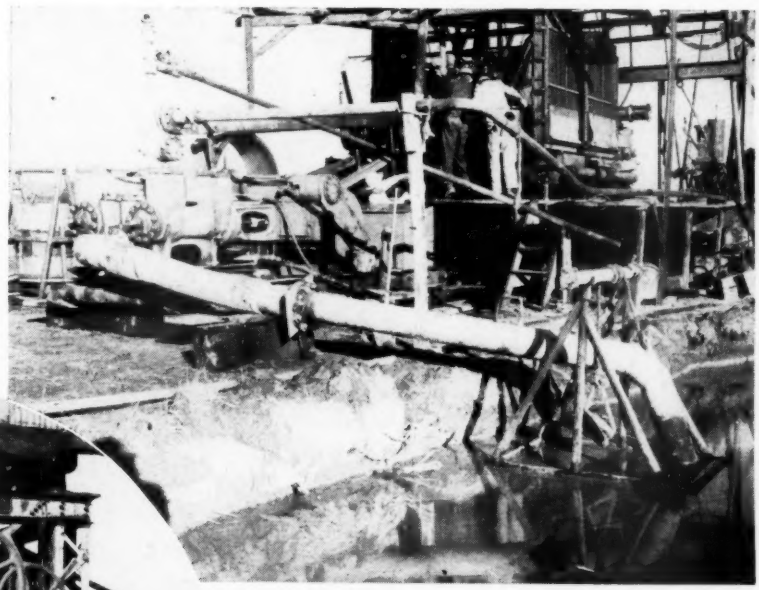
OPERATING IDEAS

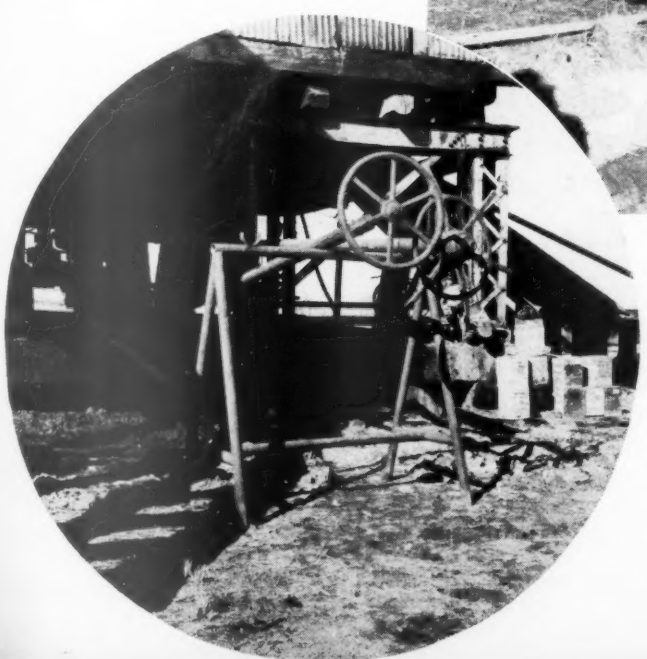
Spring for Brake Lever Line

ONE of the objections to the dead-weight loading of the draw-works brake lever is the fact that it does not provide flexibility to accommodate irregularities in the brake drum or compensate for derrick vibration. One driller in South Texas solves these difficulties by placing a heavy coiled spring in the line which supports the lever in operating position. The weight suspended from the lever pulls against the tension of this spring, its height varying with the revolution of the brake drum so as to maintain uniform loading on the brake and thus insure uniform feedoff of the line. If greater or lesser brake loading is desired, it may be obtained simply by changing the amount of weight suspended from the brake, without the necessity of changing the operating length of the supporting line. The elongation of the spring under varied loading automatically varies the amount of leverage applied to the brake toggles.

Control-Extensions Support

ON substructure derricks which are skidded, practically all equipment retains its relative position. Extensions to the stems on the blowout preventer and master gate are always close to the same elevation. Instead of using wooden frames and erecting them after each move, one West Texas contractor uses a steel bridge to support the wheel end of the extensions. The bridge is made from 2-in. pipe. The crossmember has saddles into which the extension pipes fit.





Combination Strainer and Suction Rack

ONE contractor drilling Mississippian wells in the Knox pool near Graham, Tex., uses a combination pump suction support and strainer. Bottom portion is a cubical frame covered with heavy screen with the suction support members welded to the top. It is merely placed in the pit at the appropriate spot and while supporting the suction at the same time prevents trash from getting into the pump valves.

Catwalk Facilitates Servicing Of Heavy-Duty Pumping Unit

by Neil Williams

ON large, heavy-duty pumping unit installations such as those used in the Oklahoma City and other deep pumping fields, it usually is difficult for the pumper to get to the beam head and rod hanger assembly or the pitman bearings for lubrication and adjustments. The latter parts are at a height that cannot be reached from the ground without long ladders, and are so far removed from the saddle that they cannot be reached from an access ladder which might be placed on the sampson post.

Because of this, it often is necessary for the pumper to climb out on the walking beam, which is not considered a safe practice. Having a suitable ladder handy is not always convenient, and also use of a movable ladder might lead to accidents. Also, the inconvenience and difficulty of reaching the parts encourages neglect, which is not desired, particularly at this time when proper maintenance to get the maximum service from equipment is essential for conserving material and for efficient operation.

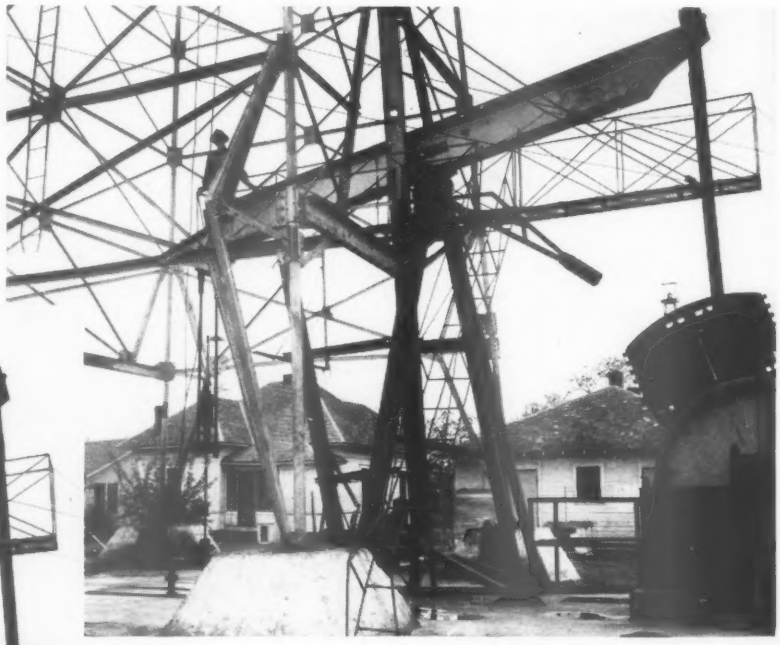
An operator in the Oklahoma City field has solved the problem by providing a catwalk which extends outward in each direction from the sampson post position to the ends of the walking beam. It is supported in the structure of the pumping derrick by the side of the walking beam and at a height convenient for the pumper to lubricate or adjust the working parts. That half of the catwalk which extends inside the derrick to the beam head assembly over the well is supported on a pivot hinge at the center point so that it folds upward against the back of the derrick when not in use. This places it out of the way when the well is in operation or when rods or tubing are being pulled.

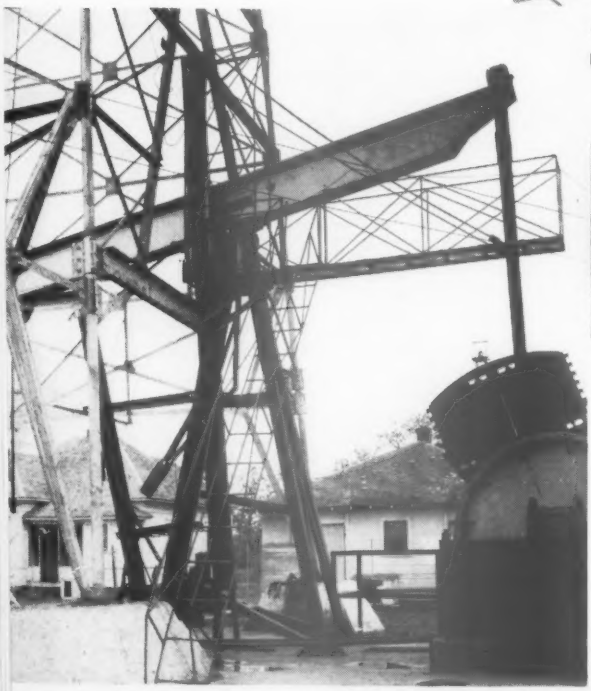
The folding section swings upwards out of the way automatically by means of a counterweight arm extension, which also holds it in its upward position. It is balanced so that only slight effort is required to lower it. The weight of a man holds it downward in working position. The back section extending to the pitman bearings is stationary and is supported at its outward end by two cables, one on each side, secured into the derrick above, and by two bracing arms on the underside.

Old Materials Used

Only old sucker rods and small piping were used in the fabrication which was done to the operator's specifications in a nearby shop. The walkway floor frame and bracing crossmembers are constructed of small piping. The flooring consists of sucker rods, cut the necessary length, laid crossways and spaced to form a grating. A guard railing extending around all sides also is constructed of rods. Included in the fabrication is a permanent ladder-type stairway, also built of sucker rods, which reaches from the ground to the back section of the catwalk. The entire unit is of welded construction.

The counterweight for the folding section is suspended on an arm extension to the back side of the floor frame of the section. This arm is made of angle iron. The counterweight swings downward, but its height is such that it is out of reach of the ground and presents no hazard.





Catwalk for servicing a large pumping-rig installation showing the folding section inside the derrick at its upward position, left, and at its downward, or working position, above

The Resolution of all Freedom Loving Peoples for this Year . . . .

Pioneer custom marked the kill of desperadoes with a notch carved on the stock of the gun for each successful job. These notches served as a tally-card for the huntsman as well as a warning to other enemies of society of his skill as a marksman.

Today the freedom loving peoples of the world are engaged in the greatest hunt in all history, to avenge the greatest crimes against civilization known to history.

We're proud to be in on this hunt . . . to work the number of hours it takes to do the job, to ration our living to match the task, to pay what it costs . . . because we want to feel we've had a part in the carving of three specific notches on the guns of Democracy this year.

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Oil men look ahead

WASHINGTON, March 8 . . . . Study of the postwar readjustments of the petroleum industry will be started at once by a newly appointed group of oil men working under the Petroleum War Council, William R. Boyd, council chairman, announces

Paul Ryan of Cleveland, formerly president of the National Refining Company and widely known oil man, has accepted the full time post as chairman of the working subcommittee and will serve without compensation—TULSA WORLD, March 9, 1943

To win the war is the first big job for all of us —the only job right now—and the oil industry is working at it full time

But it's wise to look ahead The end of the war will be the beginning of a new era for refiners who are ready to seize opportunity U.O.P. processes will offer the opportunities as they have for more than a quarter of a century

Universal refining specialists are busy in every refining center today, converting existing U.O.P. units to produce the components of 100 octane gasoline and synthetic rubber, and designing units to operate new Universal processes

Hundred octane gasoline today is a special superproduct and all of it must go to our fighting flyers till victory is won But its production won't end with the war—the oil industry never has gone backward

The American motoring—and flying—public will demand the best motor fuel there is after the war, as they always have Universal processes and Universal units will be making it

OIL IS AMMUNITION—USE IT WISELY CARE FOR YOUR CAR FOR YOUR COUNTRY

Universal Oil Products Co
Chicago, Illinois

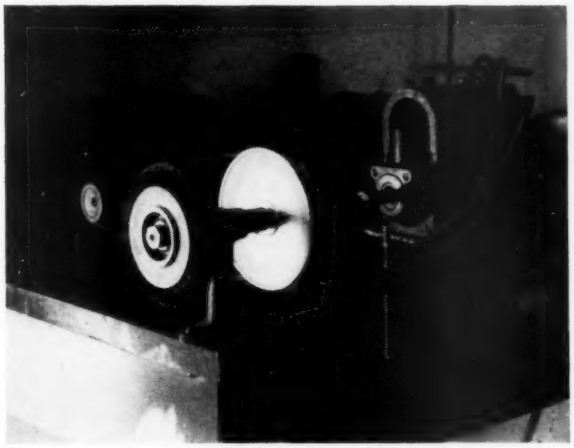
Dubbs Cracking Process
Owner and Licensor

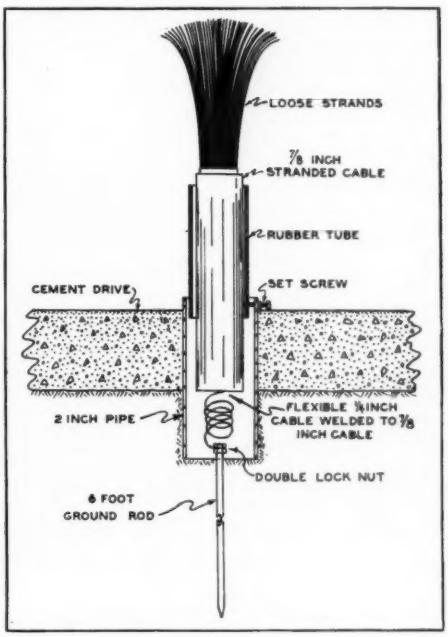
THE REFINERS INSTITUTE OF PETROLEUM TECHNOLOGY

PLANT PRACTICES

Drive Unit for Testing Magnetos

A "HOME-MADE" device to simplify testing magnetos of gas engines has been rigged up in the repair shop of an Oklahoma gasoline plant. It includes a driving unit, powered by a small electric motor, for turning the magneto at reduced speeds, the normal operating speed of the magneto being too high for satisfactory testing. This unit consists of a small rotating shaft, mounted in a supporting stand at one end of the work bench. It is turned by means of a pulley wheel attached thereto with a belt drive from the motor. For testing, the magneto is set on a small stand with the end of the magneto shaft in alignment with the shaft of the driving unit. A short section of ordinary rubber hose is used for a coupling. A buffer brush wheel has been installed on the opposite (outside) end of the drive shaft for cleaning parts. The unit was built from miscellaneous scrap parts. The motor was taken from an old fan. Contact points for testing are set between two parallel blocks of wood, barely visible.





Static Eliminators at Loading Docks

DRIVEWAYS of tank-wagon loading docks in one large Kansas refinery are equipped with static "wipers" designed to discharge to the ground any static electricity from trucks entering the docks. Although most tank trucks drag chains for this purpose there is always the chance that the chains may have been broken off or otherwise removed, creating an explosion hazard from possible static sparks when loading is started. The wipers automatically eliminate this hazard.

A wiper and its method of installation are shown in the accompanying drawing and picture. The body consists of a short section of ⅞-in. stranded cable, the top end of which is unstranded a short length to form a wire brush. It is set inside a 2-in. pipe embedded in the concrete drive and extending down to the ground below the base of the concrete. The top end of the pipe extends just enough above the drive for a set screw which fastens the stranded cable in place. The brush is at sufficient height to touch the bottom of any truck passing over it. The protruding portion of the stranded cable below the unraveled strands is encased in a stiff rubber tube to protect it and to return it to upright position if bent over by a truck. The bottom end of the stranded cable is connected to the top of a 6-ft. ground rod, driven into the ground inside the 2-in. pipe, by a long ¼-in. flexible cable or wire welded onto the bottom. This wire permits removal of the cable for replacement without pulling the ground rod. When the cable is lifted out, the flexible wire can be removed by unfastening the lock nut on top the ground rod. Several of these wipers are installed in a driveway, these being spaced at convenient intervals along the center line. They contact trucks at several points.

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WE of National Supply feel that our awards of the Victory Fleet Flag, Maritime "M" and the Army-Navy "E" stand for more than just production achievements.

What we've accomplished has been due largely to Earnestness. When you put your whole heart and soul into a job, you're bound to come out on top. That's what the boys at the front are doing. And we're backing them up with the best we've got.

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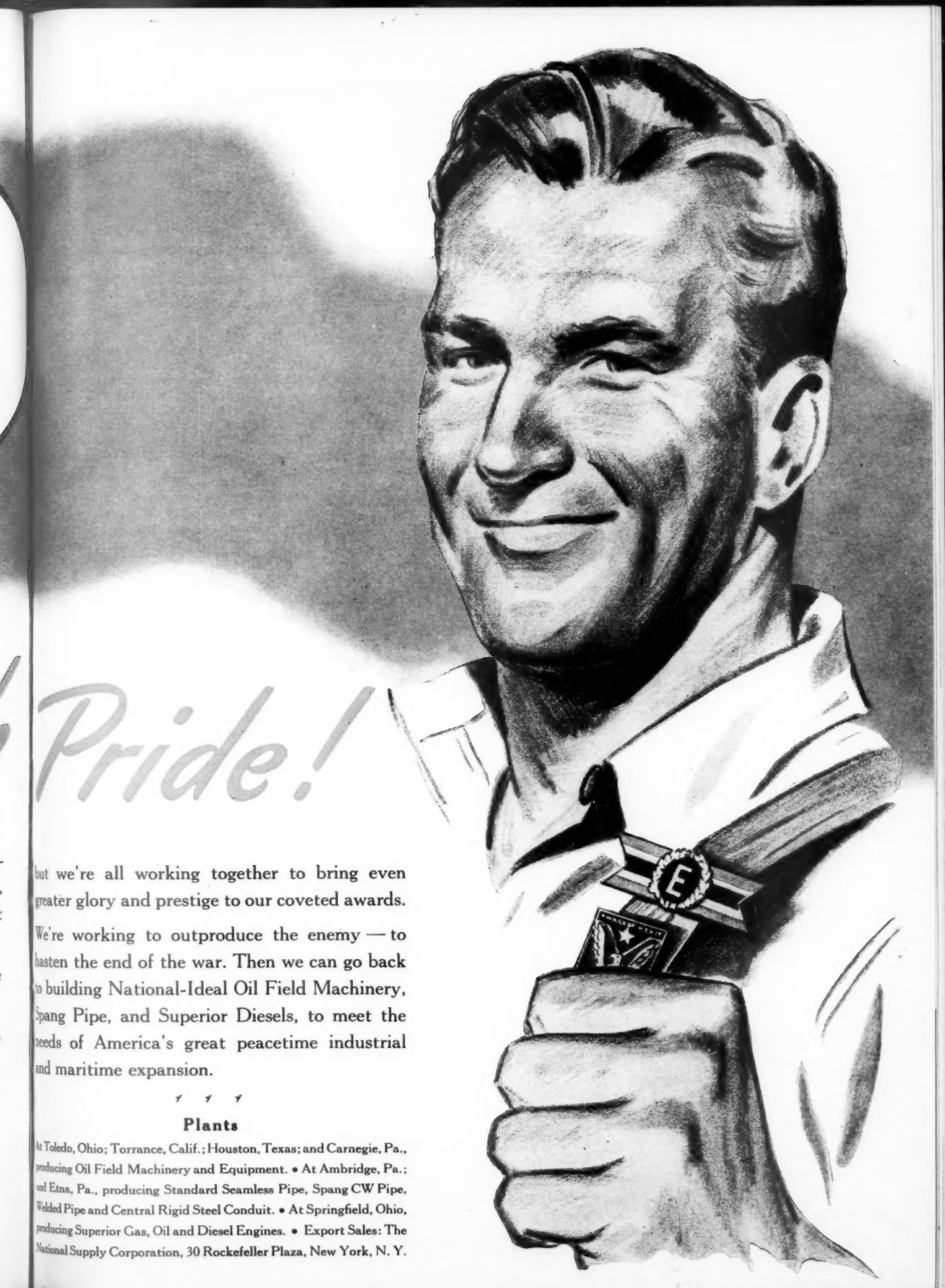

Pride!

but we're all working together to bring even greater glory and prestige to our coveted awards.

We're working to outproduce the enemy — to hasten the end of the war. Then we can go back to building National-Ideal Oil Field Machinery, Spang Pipe, and Superior Diesels, to meet the needs of America's great peacetime industrial and maritime expansion.

* * *

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At Toledo, Ohio; Torrance, Calif.; Houston, Texas; and Carnegie, Pa., producing Oil Field Machinery and Equipment. • At Ambridge, Pa.; and Etna, Pa., producing Standard Seamless Pipe, Spang CW Pipe, Welded Pipe and Central Rigid Steel Conduit. • At Springfield, Ohio, producing Superior Gas, Oil and Diesel Engines. • Export Sales: The National Supply Corporation, 30 Rockefeller Plaza, New York, N. Y.

XUM

PROGRESS IN METALS

by W. L. Nelson

Chromium Manganese Stainless Steels

The development of chromium manganese stainless steels as substitutes for the widely known stainless steels of the chromium nickel (18-8) variety is progressing so satisfactorily that it is now thought possible that such steels may continue to be useful even after the war. The search for these steels was instigated by the extreme scarcity of nickel—and in fact a substitute for chromium would be almost as welcome as a substitute for nickel. The stainless chromium steels (18-8) are used extensively in petroleum refineries for corrosion resistance and for the resistance to high-temperature oxidation or rusting of certain furnace parts—particularly for the high-temperature (1,100°-1,300° F.) tubing materials that are needed for butadiene and 100-octane gasoline manufacture.

Engineers of the Electro Metallurgical Co. have been conducting researches on the suitability of the chromium stainless steels in which all or part of the nickel of such steels is replaced with manganese—and references to their work are given in the references at the end of this article.

According to these articles the chromium manganese stainless steels are similar in many ways to the chromium nickel steels, exceeding them in many properties and lagging slightly in other respects. The stainlessness or corrosion resistance of the manganese variety steels is not made entirely clear—but it is to be supposed that the chromium manganese steels are about equal to the regular 18-8 chromium nickel steels because the chromium is the main factor in establishing the corrosion resistance. It is presumed that these new steels could be used in most refinery services to replace the 18-8 chromium nickel steels that are now used so widely.

Physical property tables are given in the articles and are also summarized in a composite abstract given on pages 960-966 of Metals & Alloys of November 1942.

References

Franks & Binder, J. Aeronautical Sci., Sept., pp. 419-438, 1942.

Bandel, Metals & Alloys, Vol. 15, pp. 174-178, Jan. 1942.

Franks & Binder, Proc. A.S.T.M., Vol. 41, pp. 629-645, 1941.

Franks, Binder & Brown, Iron Age, Vol. 150, pp. 51-57, Oct. 1, 1942.

Nelson (this page), Substitute High-Temperature Steels, Aug. 14, p. 63, 1941.

Oiled Surfaces for Protection Against Corrosion

Abstract, A. K. Graham, "Oil Black Coatings on Steel," Metal Finishing, Vol. 40, May 1942, pp. 254-55. From Metals and Alloys, August 1942.

Normally the use of oiled surfaces as a protection against corrosion receives little attention but in our present dire need there are doubtless many equipments that can be preserved for a time by such a method. Field men, oil operators, and piping men are all familiar with the degree of protection offered by the thin film of oil or dope on the outside of tubular goods as it is received from the manufacturer. In many instances this thin film of oil provides enough protection to halt for many months the initial stages of even severe corrosion.

Black oxide coatings of any type will fail in less than 10 hours in the salt spray, but when coated with supplemental coatings of oil or lacquer, better protective value is obtained than with the supplemental coating alone.

An oiled oxide coating having a certain rating in the salt spray is not equivalent in protective value to a metallic coating having a similar rating, because an oiled coating is subject to injury by ordinary handling. Where an oiled film is specified over a black oxide coating, it is frequently expected that the surface will be maintained by occasional oiling.

Since handling or wrapping may alter the uniformity of oiled coatings, they should not be touched prior to or during the salt spray test. To obviate difficulties caused by nonuniformity of spray, from four to eight duplicate samples should be distributed through the salt spray chamber, and each sample should have the same degree of inclination, as horizontal surfaces fail sooner than vertical surfaces.

The samples are evaluated by giving them a number indicating the degree of rusting. As salt spray ratings are not exact, it is advisable to have a standardized oil film to use as a basis of comparison.

Salvage of Oil-Well Pump Parts

Chief of the Salvage Section H. M. Trent of the Petroleum Administration for War has started a campaign among manufacturers and supply houses to collect or salvage used deep-well pump parts which contain scarce alloy materials. The types of materials are mainly stainless steels, tool steel (high carbon and alloy) and nonferrous alloys or metals. The main item is stainless steel seats and balls.

Under the plan, the purchaser of a new part will turn in his used part at the supply house at the time of purchase. Operators or purchasers who follow the plan will be placed on a preferred list (given a credit) for the purchase of new parts, even if the purchase is deferred to some future date. Pump manufacturers act as central collection agencies for the supply houses and the supply houses are also given a "credit" on the purchase of new parts by the manufacturer. Finally, the manufacturer reports to PAW recommending reconditioning or remelting.

The plan should not only save much useful material for our war effort but will help in assuring the petroleum industry of a constant supply of these necessary pump parts.

Metal-Working Terms

Milling Operations

The operation of **milling** involves the use of a rotary cutter (or **hob**) which has a number of cutting edges rather than the one edge that is used on a lathe tool. The surfaces of the metal are milled by this circular cutter which rotates while the work is being fed past the cutter. An enormous number of milling operations and cutters are possible including such types as plane cutters (plane surfaces), profile cutters (irregular profile), slot cutters, metal slitting cutters (as for screw heads) and thread milling cutters.

Milling cutters have completely revolutionized machine shop practice during the last 20 years, and even today they are displacing the planer, shaper, slot-cutting machine and thread-cutting machine in all but the smallest shops.

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To Locate MORE Producing Sands...

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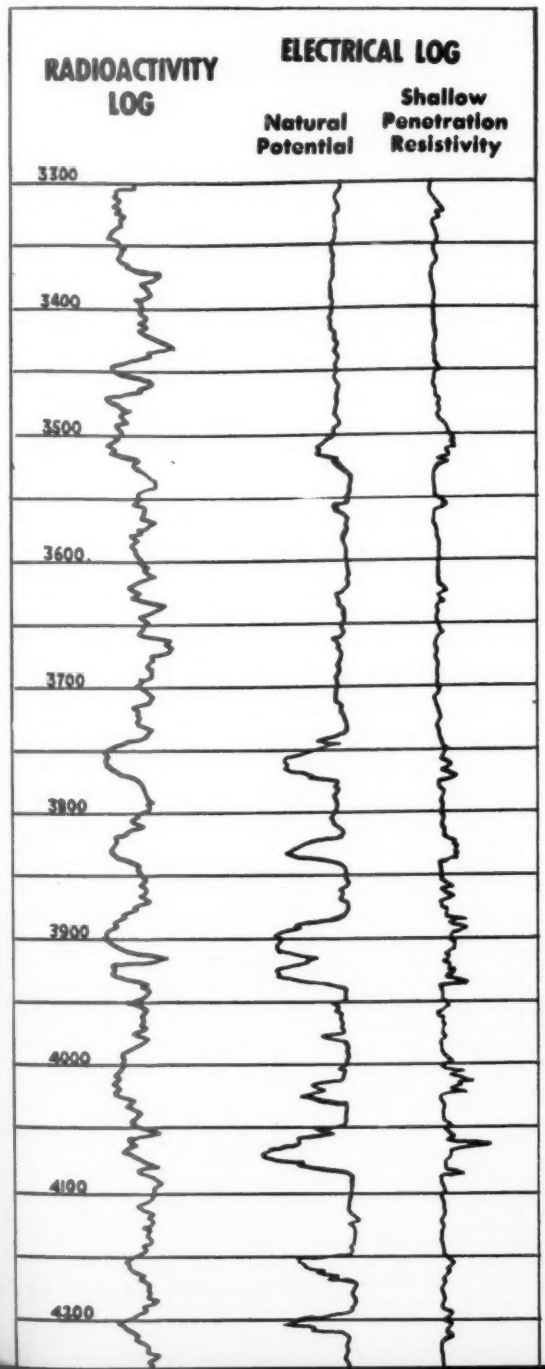

New production from existing wells will play a relatively more important part this year than ever before in America's production of crude oil. Radioactivity Well Logging accurately locates the depths of all potential producing zones, which may have been cased-off in the original completion, so they can be opened and tested.

The accuracy of a Radioactivity Log is the same in a dry hole or in fluid — The curve is not materially affected by multiple strings of casing.

How effectively you can use Radioactivity Logs in your remedial program and how these Logs have enabled many operators to sustain production from their wells, you can learn from a Lane-Wells Service Engineer. A call to your nearest Lane-Wells Branch Office will bring you this information at once.

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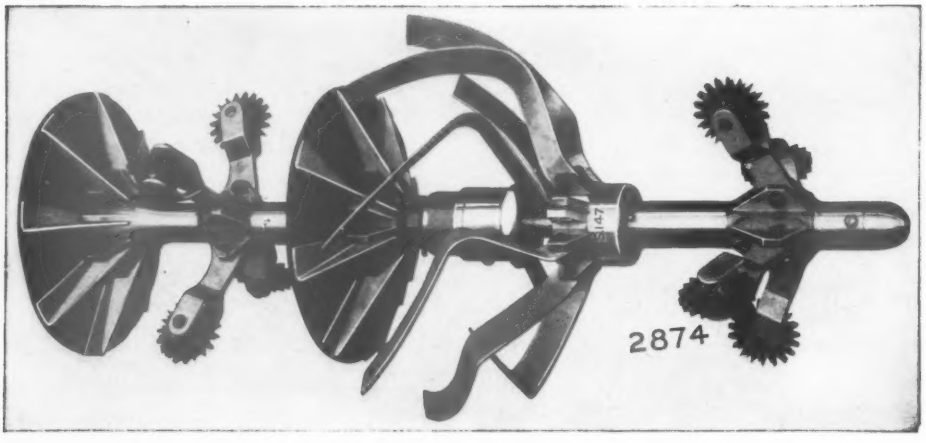
Clean last Winter's deposits from your pipe lines with



Nearly 100% employee participation in pay-roll deduction plan for War Bonds.

TRANSIT LINE SCRAPERS

The material adhering to the inside circumference of the line is scraped off clean by the thin, overlapping spring steel knives shown in the illustration above.

With the exception of the 3″ and 4″ sizes, TRANSIT Line Scrapers are available in two types, the Standard and the Heavy Duty. The 8″, 10″ and 12″ Heavy Duty type features front and rear Guide Arm assemblies with double glass-hard guide wheels, spot-welded to a bushing. This assembly rotates on a hardened steel renewable bushing, which is held tightly from turning, by a rivet through the open end of each guide arm. 6″ Heavy Duty type have single guide wheels. All guide wheels on our Heavy Duty Scrapers are the same as used on emery wheel dressers and are glass hard. Other than above, construction is identical with Standard Type.

TRANSIT Line Scrapers were the original tools for this service and were designed over forty years ago by experienced pipeline men.

Both types of Scrapers, and repair parts, are stocked both in Tulsa, Oklahoma, and Oil City, Pennsylvania, for all size scrapers.

Our new Bulletin No. 805, describing these line scrapers in detail, will be mailed on request. Address the Home Office or any district office of the Company.

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Infra-Red Spectroscopy

(Continued from Page 38)

that closing the switch to 110 volts a.c. impresses the proper voltage across both the heater and the Nernst glower. As soon as the glower reaches the temperature at which it conducts appreciable current the relay shuts off the heater.

Due to the high operating temperature certain precautions in the construction of the internal parts are necessary. All studs, spacers, and nuts are made of stainless steel. The terminals are connected to the Nernst glower by the method described by Ebers and Nielsen* and the special heat-resistant wire, Kanthol A, is used for the heater.

A complete analysis unit is shown in Fig. 8. The gas-handling system, on the right, is used to fill the absorption cell with a standard pressure of sample. Time is saved by sweeping the system with air between samples. The old sample plus the sweeping air is removed by an auxiliary vacuum line and the mechanical pump is used only to remove the remaining air. All controls including the shutter valve, the galvanometer scale, and the source switch, are arranged so that they can be manipulated from the same position as the gas-handling system. The circuit for controlling the source is shown under the table in a separate gas-tight case. This gas-tight feature can be extended to the wiring so that the unit can be operated in fire-restricted areas.

The instrument as described is designed for analytical procedures based on the measurement of the absorption of gases between 2μ and 15μ. However, neither the restriction to gas samples or to this spectral region is inherent in the design of the spectrophotometer. Substitution of a potassium bromide prism for the sodium chloride prism would permit work to about 25μ and substitution of a quartz or lithium fluoride prism would increase the resolving power at wave lengths shorter than 6μ. A method for inserting liquid cells, like those described by Gildart and Wright,† would permit analysis of liquid samples.

Acknowledgments

The author wishes particularly to acknowledge his indebtedness to Dr. O. Beeck, who instigated and guides spectroscopic work at Shell Development Co., and to Dr. R. S. Rasmussen, the author's coworker. Mr. H. H. Cary and Dr. A. O. Beckman have made major contributions to the design of the spectrophotometer and Dr. J. U. White of the Esso Laboratories, and Dr. W. H. Avery of Shell Oil Co., Inc., contributed helpful criticism and suggestions.

*E. S. Ebers and H. H. Nielsen, "A Method for Increasing the Life of Nernst Glowers," Rev. Sci. Inst., 11, 429 (1940).

†"An Infra-Red Absorption Cell for Volatile Liquids," L. Gildart and N. Wright, Rev. Sci. Inst. 12, 204 (1941).

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STARTS HERE

Trained men who have years of experience work with modern, time-saving equipment to unload or load tankers and speed them on their war-time missions. While General American facilities help rush liquid commodities to war plants and battle lines, there is always emphasis on protective services—guarding against contamination, evaporation, leakage, fire.

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A SYMBOL OF INTEGRITY FOR OVER 40 YEARS

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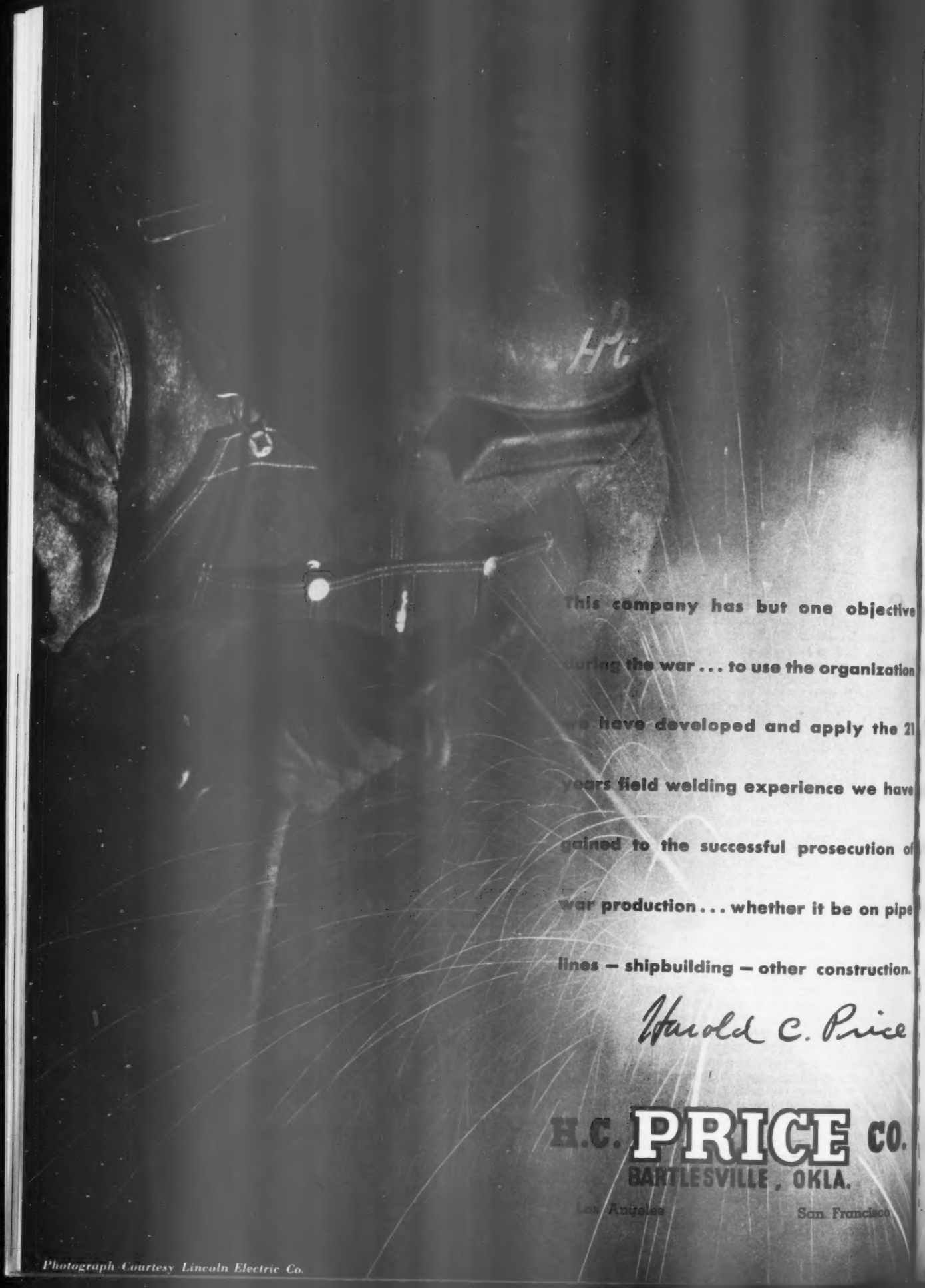

This company has but one objective during the war . . . to use the organization we have developed and apply the 21 years field welding experience we have gained to the successful prosecution of war production . . . whether it be on pipe lines — shipbuilding — other construction.

Harold C. Price

H.C. PRICE CO.

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Photograph Courtesy Lincoln Electric Co.

XUM

ECONOMIC LIMIT IS HIGHLY VARIABLE AND CHANGING FACTOR

ONE of the terms frequently used by the engineers and geologists when discussing either the operation or value of a particular oil-producing property is the economic limit, i.e., the rate of production at which the profit from the oil no longer returns an adequate income on the investment. On the basis of the economic limit, properties are traded, bought and sold, abandoned, kept on production, and reserves estimated.

Establishing an economic limit is a useful procedure, however, it should not fail to set out the time at which the economic limit was established, the price being paid for the oil produced and the other conditions. It is quite obvious that a well which is unprofitable at its rate of production at one price, is a profitable one at a slightly higher price.

Determination of Limit

The tendency at present is to set an economic limit of so many barrels of oil per day for the wells in a particular field and to base abandonments on this predetermined schedule. Actually, some of the wells making less than the economic limit may be paying a profit while those making a considerable quantity of oil over the economic limit may be causing a loss. If the well producing the larger quantity of oil must be worked on frequently, produces a large quantity of water, or an emulsion difficult and expensive to break, it can be unprofitable. The smaller well, producing clean oil, with infrequent rod breaks and practically no cleanout work continues to pay dividends. Valued on the amount of oil produced, the larger well would be kept on production whereas estimated on the profit obtained from the operation, the smaller one would be maintained.

The methods of production and even the rate at which the equipment is operated likewise affect the economic limit. An unsuitable production method may cause the properties to lose their value long before the predetermined economic limit has been reached while a more efficient method might carry them beyond the same limit. Any operating method which leads to an increase in rod breaks or more frequent workovers, etc., obviously diminishes the income to where only the more productive wells can be maintained on production.

Salvage Value

After a well has been depreciated to the point where the original investment has been returned and a profit made on the operation, the value of the property depends on the oil remaining in place which can be profitably recovered, plus the salvage value. When considering a well for abandonment the operating costs, the overhead chargeable to the well and its salvage value are considered. The well should make interest on the salvage value at least if it is to be considered as profitable.

The difficulty arises in establishing the salvage value. Normally, the tendency is to assign a salvage value equal to what it would cost to replace the equipment or to obtain similar material. Actually, this is an inflated value as it leaves out the cost of salvaging the property and the loss and damage of equipment during the salvaging process. If the true or net salvage value is considered, the well may show a profit whereas it shows a loss at the gross salvage price. Quite a few operators have found in recent months, when the market for second-hand material has been strong, that the net return of the salvage from wells abandoned has not been sufficient to warrant plugging the wells and giving up the production from them. In some instances, the salvage from wells has paid no more than the cost of the work and consequently the wells could have been considered profitable as long as they produced enough oil to pay the labor, overhead and taxes and left some surplus.

Properties can in many cases show a profit and bear their proportional share of the overhead up to and including the district but cannot support the general overhead charges under the organization of some companies. Such properties do have a value as they reduce the per-barrel overhead charges for the district and do not reach the economic limit as long as they pay their operating costs, taxes, etc.

There is a wide range in the operating costs under different companies and an unprofitable property for one company will pay dividends for another. Generally speaking, the larger companies have higher costs and consequently must show a larger profit per well operated. In many cases a property which must be sold by a large company can be operated by a smaller company at a profit. In one case the economic limit may be 2 bbl. per well per day while in the other it is 1 bbl. per well per day. A still smaller company, or an individual, may operate the property profitably until it reaches 0.5 bbl. per well per day.

Partnerships

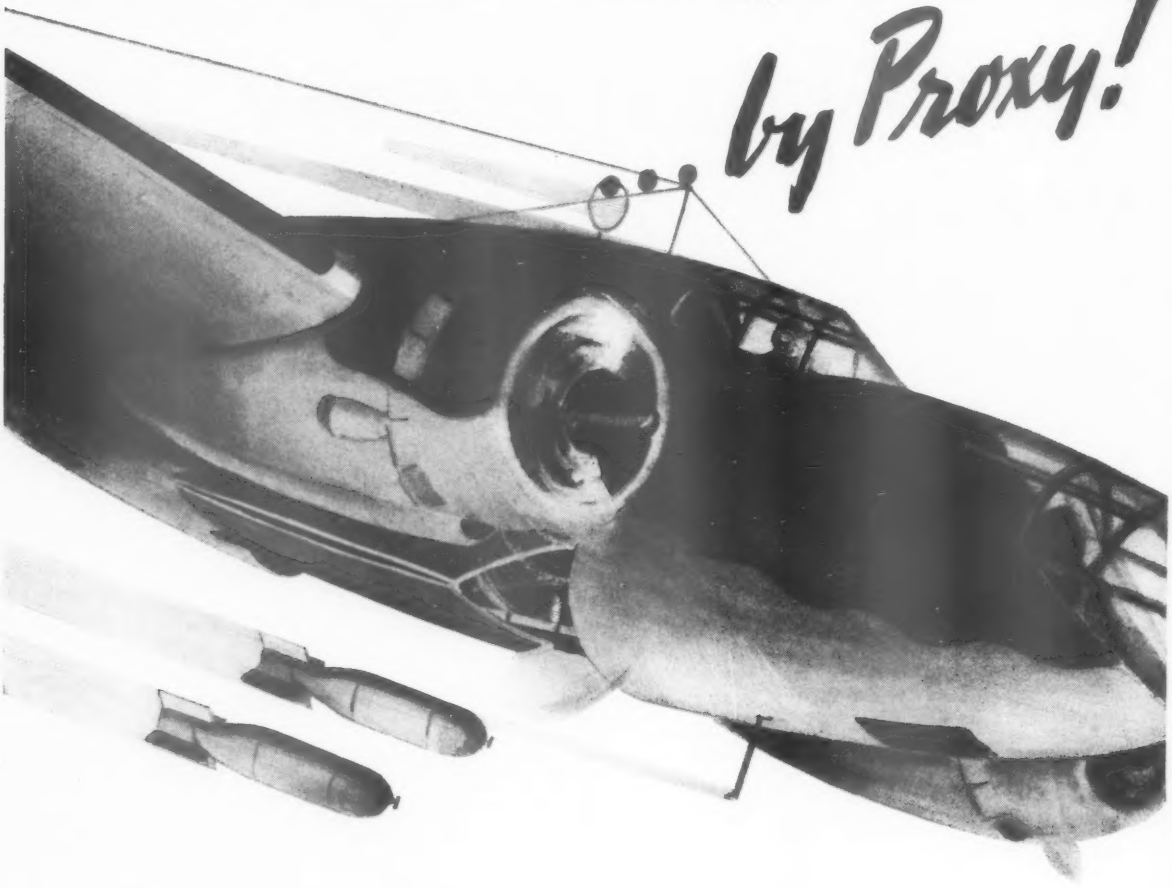
On partnership deals, which company operates the property determines the profit from it and the economic limit for the wells. For this reason, toward the latter life of a property, one company will purchase the other's interest because of its ability to produce the oil cheaply. The company selling the property would not be interested as a buyer because for it, the economic limit has been passed. In some cases, a change in the company producing the oil will result in a partnership showing a profit where it formerly showed a loss.

From the foregoing it is evident that economic limit for any particular oil-producing property is a highly variable factor and one which changes or can be changed.

An arbitrary value for the economic limit is useful in estimating the recoverable reserves and in establishing oil property values for buying, selling or trading purposes. The decline curve for the properties can be established and the cost of operating the properties estimated from the present conditions and costs. It is thus possible to determine the minimum oil production which will yield a profit from the property and the probable operating life of the field determined. However, it should never be forgotten that such a figure is only an estimate and that the real economic limit is determined by factors existing at the particular time when the property or well is being evaluated.

MASTER CRAFTSMEN "DOING THEIR BIT"

by Proxy!



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A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL

DISPLACEMENT AND CAPACITY OF GAS COMPRESSORS

IN connection with a gas compressor the term **displacement** is used in two different senses, i.e., **nominal** displacement and **volumetric** displacement. By **nominal displacement** is meant the total volume displaced by the piston during a given length of time, while the term **volumetric displacement** refers to the volume of gas, measured at intake pressure and temperature, that the compressor will handle per unit of time. **Displacement volume** as used in Installment 77 and indicated in Figs. 1 and 2 of that installment represent the nominal displacement per cycle. The volume ab in Figs. 1 and 2 of Installment 77 represents the volumetric displacement per cycle. The volumetric displacement for one cycle or for any given period of time is equal to the product of the nominal displacement for the cycle or other given period of time and the volumetric efficiency.

Closely interrelated with the displacement terms just mentioned is the term **capacity**, which refers to the **standard** volume of gas handled per cycle or per unit of time. The capacity of a compressor is calculated by using the perfect gas laws* to correct the volume expressed by the volumetric displacement from compressor intake conditions to standard conditions.

All of the three items—nominal displacement, volumetric displacement, and capacity—are expressed variously as cubic feet per cycle, cubic feet per minute, and thousands of cubic feet per 24 hours.

The determination of the nominal displacement per cycle for a single-acting cylinder consists of calculating the volume of a cylindrical space the diameter of which is the bore of the compressor cylinder and the length of which is equal to the length of stroke of the compressor piston. For a double-acting compressor, a proper correction must be made for the volume of the piston rod. If the piston rod is attached to the piston, and does not extend on through the compressor cylinder head as on some tandem compressors, the nominal displacement per cycle on the crank end of the cylinder will be less than the nominal displacement per cycle on the head end by an amount equal to the volume of the piston rod.

*In some cases it is necessary to consider deviation from the perfect gas laws.

From the above discussion, the following equation can be written for single-acting compressors:

$$D_n = \frac{\pi d^2 \times L}{4 \times 1728} = 0.000454\ d^2L \quad (1)$$

Where

D_n = nominal displacement, cu. ft. per cycle

d = bore of compressor cylinder, in.

L = length of piston stroke, in.

If the nominal displacement is desired in cubic feet per minute, the equation becomes

$$D_n = 0.000454d^2LN \quad (2)$$

Where

D_n = nominal displacement, cu. ft. per min.

N = speed of compressor, r.p.m., and where d and L, are as defined for Equation 1.

If the nominal displacement is desired in thousand cubic feet, the equation becomes

$$D_n = \frac{0.000454d^2LN \times 60 \times 24}{1000} = 0.000654d^2LN \quad (3)$$

Where D_n = nominal displacement, M.c.f. per 24 hours, and all other terms are as defined in connection with Equations 1 and 2.

Values given in Table 1 represent twice the quantities that are calculated by substituting the given values of d in Equations 1, 2, and 3 and using L equal to 20 in. and N equal to 200 r.p.m.

In Table 2 are given quantities that must be subtracted from the values read from Table 1 in order to allow for the volume occupied by the piston rod.

Correction factors given in Table 3

TABLE 1
Nominal Displacement of Compressors
(Based on double-acting compressor with 20-in. stroke and operating at 200 r.p.m. Piston-rod volume not considered.)

Cylinder bore, in.	Cu. ft. per cycle	Cu. ft. per min.	M.c.f. per 24 hr.
3	0.163	32.6	47.2
3¼	0.192	38.4	55.3
3½	0.223	44.6	64.2
3¾	0.256	51.2	73.7
4	0.291	58.2	83.8
4¼	0.328	65.7	94.6
4½	0.368	73.7	106.1
4¾	0.410	82.1	118.2
5	0.454	90.9	130.9
5¼	0.500	100.2	144.4
5½	0.550	110.0	158.4
5¾	0.601	120.2	173.1
6	0.654	130.9	188.5
6¼	0.710	142.1	204.6
6½	0.768	153.7	221.3
6¾	0.828	165.7	238.6
7	0.891	178.2	256.6
7¼	0.955	191.1	275.2
7½	1.022	204.5	294.5
7¾	1.092	218.4	314.5
8	1.163	232.7	335.1
8¼	1.237	247.5	356.4
8½	1.313	262.7	378.3
8¾	1.390	278.1	400.6
9	1.472	294.5	424.1
9¼	1.554	310.7	447.6
9½	1.641	328.2	472.6
9¾	1.726	345.2	497.4
10	1.818	363.6	523.6
10½	2.004	400.9	577.3
11	2.200	440.0	633.6
11½	2.404	480.8	692.4
12	2.618	523.6	754.0
12½	2.841	568.2	818.2
13	3.061	612.2	881.6
13½	3.313	662.7	954.3
14	3.563	712.7	1,026.3
14½	3.822	764.5	1,100.9
15	4.090	818.1	1,178.1
15½	4.368	873.6	1,258.0
16	4.654	930.9	1,340.4
16½	4.938	987.6	1,422.2
17	5.254	1,050.9	1,513.2
17½	5.568	1,113.6	1,603.6
18	5.890	1,178.1	1,696.5
18½	6.222	1,244.5	1,792.0
19	6.563	1,312.6	1,890.2
19½	6.913	1,382.7	1,991.0
20	7,272	1,454.5	2,094.4

TABLE 2
Compressor Displacement Corrections for Various Sizes of Piston Rod
(Based on 20-in. piston stroke and 20 r.p.m.)

Rod dia. (in.)	Cu. ft. per cycle	Cu. ft. per min..	M.c.f. per 24 hr
1	0.009	1.8	2.6
1¼	0.014	2.8	4.2
1½	0.020	4.1	5.9
1¾	0.028	5.6	8.0
2	0.036	7.3	10.5
2¼	0.046	9.2	13.3
2½	0.057	11.4	16.4
2¾	0.069	13.7	19.8
3	0.082	16.4	23.5

Series prepared by Glenn M. Stearns, associate professor of petroleum engineering, University of Oklahoma

may be used to correct the values taken from Table 1 for any speed other than 200 r.p.m. and for any given stroke length other than 20 in.

When calculating the displacement of single-acting compressors, values can be read from Table 1, divided by 2, and corrected to the given speed and stroke length by use of an appropriate factor from Table 3. For such calculations Table 2 is not used.

When dealing with a double-acting compressor equipped with a piston rod extending through only one end of the cylinder, a value is read from Table 1 corresponding to the cylinder diameter. From this is subtracted a value taken from Table 2 corresponding to the given piston-rod size. The remainder is then multiplied by a correction factor taken from Table 3. Since most compressors are of this type, this will be the most common use of these tables.

If the compressor cylinder under consideration is double acting but has a piston rod extending through both ends of the cylinder, the calculation of displacement from the accompanying tables differs from that for the other type of double-acting machine only slightly; i.e., a value taken from Table 2 should be multiplied by 2 and this subtracted from the value read from Table 1.

Example 1

Problem.—Given the following data concerning a double-acting compressor:

Diameter of cylinder, in.	8¼
Diameter of piston rod, in.	1¾
Length of stroke, in.	12
Clearance ratio, per cent	12
Exponent of compression, n	1.2
Speed, r.p.m.	280
Intake pressure, lb. per sq. in., abs.	64
Discharge press., lb. per sq. in., abs.	254
Intake temperature, °F.	80

(Piston rod extends through crank end only)

Determine. — (1) Nominal displacement, M.c.f. per 24 hr.; (2) volume of gas, measured at standard conditions of 14.7 lb. per sq. in. abs., and 60° F., that the compressor will handle in M.c.f. per 24 hr.

Solution. — (1) From Table 1, the value corresponding to a cylinder diameter of 8¼ in. is 356.4 M.c.f. per 24 hr.

From Table 2, the volume displaced by a 1¾-in. rod is found to be 8 M.c.f. per 24 hr.

From Table 3, the correction factor for a speed of 280 r.p.m. and a stroke length of 12 in. is 0.840.

Then, the nominal displacement is equal to $D_n = (356.4 - 8)\ (0.840) = 292.6$ M.c.f. per 24 hr.

2. The volumetric efficiency must next be calculated.

The pressure ratio is

$$R = (254/64) = 3.97$$

or, R = 4, for practical purposes.

From Table 1 of Installment 77 the value of $(R^{1/n} - 1)$ in the efficiency formula (corresponding to R = 4 and n = 1.2) is 2.175.

Then, using Equation 2 of Installment 77,

$$E_v = 0.98 - 0.12\ (2.175) = 0.72, \text{ or } 72\%$$

Then, the volumetric displacement is $D_v = 0.72 \times 292.6 = 211$ M.c.f. per 24 hr. The volumetric displacement represents volume of gas compressed if measured at intake pressure and temperature.

Using the perfect gas law to correct to standard conditions the capacity of the compressor is

$$C = 211 \times \frac{64}{14.7} \times \frac{(460 + 60)}{(460 + 80)}$$

$$= 875 \text{ M.c.f. per 24 hr.}$$

TABLE 3
Correction Factors for Compressor Displacement
(Based on value of 1.00 when stroke length is 20 in. and r.p.m. is 200)

	Piston stroke (in.)															
R.p.m.	4	5	6	7	8	9	10	11	12	13	14	16	20	24	30	36
60	0.060	0.075	0.090	0.105	0.120	0.135	0.150	0.165	0.180	0.195	0.210	0.240	0.300	0.360	0.450	0.540
70	0.070	0.087	0.105	0.122	0.140	0.157	0.175	0.192	0.210	0.227	0.245	0.280	0.350	0.420	0.525	0.630
80	0.080	0.100	0.120	0.140	0.160	0.180	0.200	0.220	0.240	0.260	0.280	0.320	0.400	0.480	0.600	0.720
90	0.090	0.112	0.135	0.157	0.180	0.202	0.225	0.247	0.270	0.292	0.315	0.360	0.450	0.540	0.675	0.810
100	0.100	0.125	0.150	0.175	0.200	0.225	0.250	0.275	0.300	0.325	0.350	0.400	0.500	0.600	0.750	0.900
110	0.110	0.137	0.165	0.192	0.220	0.247	0.275	0.302	0.330	0.357	0.385	0.440	0.550	0.660	0.825	0.990
120	0.120	0.150	0.180	0.210	0.240	0.270	0.300	0.330	0.360	0.390	0.420	0.480	0.600	0.720	0.900	1.080
130	0.130	0.162	0.195	0.227	0.260	0.292	0.325	0.357	0.390	0.422	0.455	0.520	0.650	0.780	0.975	1.170
140	0.140	0.175	0.210	0.245	0.280	0.315	0.350	0.385	0.420	0.455	0.490	0.560	0.700	0.840	1.050	1.260
150	0.150	0.187	0.225	0.262	0.300	0.337	0.375	0.412	0.450	0.487	0.525	0.600	0.750	0.900	1.125	1.350
160	0.160	0.200	0.240	0.280	0.320	0.360	0.400	0.440	0.480	0.520	0.560	0.640	0.800	0.960	1.200	1.440
170	0.170	0.212	0.255	0.297	0.340	0.382	0.425	0.467	0.510	0.552	0.595	0.680	0.850	1.020	1.275	1.530
180	0.180	0.225	0.270	0.315	0.360	0.405	0.450	0.495	0.540	0.585	0.630	0.720	0.900	1.080	1.350	1.620
190	0.190	0.237	0.285	0.332	0.380	0.427	0.475	0.522	0.570	0.617	0.665	0.760	0.950	1.140	1.425	1.710
200	0.200	0.250	0.300	0.350	0.400	0.450	0.500	0.550	0.600	0.650	0.700	0.800	1.000	1.200	1.500	1.800
210	0.210	0.262	0.315	0.367	0.420	0.472	0.525	0.577	0.630	0.682	0.735	0.840	1.050	1.260	1.575	1.890
220	0.220	0.275	0.330	0.385	0.440	0.495	0.550	0.605	0.660	0.715	0.770	0.880	1.100	1.320	1.650	1.980
230	0.230	0.287	0.345	0.402	0.460	0.517	0.575	0.632	0.690	0.747	0.805	0.920	1.150	1.380	1.725	2.070
240	0.240	0.300	0.360	0.420	0.480	0.540	0.600	0.660	0.720	0.780	0.840	0.960	1.200	1.440	1.800	2.160
250	0.250	0.312	0.375	0.437	0.500	0.562	0.625	0.687	0.750	0.812	0.875	1.000	1.250	1.500	1.875	2.250
260	0.260	0.325	0.390	0.455	0.520	0.585	0.650	0.715	0.780	0.845	0.910	1.040	1.300	1.560	1.950	2.340
270	0.270	0.337	0.405	0.472	0.540	0.607	0.675	0.742	0.810	0.877	0.945	1.080	1.350	1.620	2.025	2.430
280	0.280	0.350	0.420	0.490	0.560	0.630	0.700	0.770	0.840	0.910	0.980	1.120	1.400	1.680	2.100	2.520
290	0.290	0.362	0.435	0.507	0.580	0.652	0.725	0.797	0.870	0.942	1.015	1.160	1.450	1.740	2.175	2.610
300	0.300	0.375	0.450	0.525	0.600	0.675	0.750	0.825	0.900	0.975	1.050	1.200	1.500	1.800	2.250	2.700
310	0.310	0.387	0.465	0.542	0.620	0.697	0.775	0.852	0.930	1.007	1.085	1.240	1.550	1.860	2.325	2.790
320	0.320	0.400	0.480	0.560	0.640	0.720	0.800	0.880	0.960	1.040	1.120	1.280	1.600	1.920	2.400	2.880
330	0.330	0.412	0.495	0.577	0.660	0.742	0.825	0.907	0.990	1.072	1.155	1.320	1.650	1.980	2.475	2.970
340	0.340	0.425	0.510	0.595	0.680	0.765	0.850	0.935	1.020	1.105	1.190	1.360	1.700	2.040	2.550	3.060
350	0.350	0.437	0.525	0.612	0.700	0.787	0.875	0.962	1.050	1.137	1.225	1.400	1.750	2.100	2.625	3.150
360	0.360	0.450	0.540	0.630	0.720	0.810	0.900	0.990	1.080	1.170	1.260	1.440	1.800	2.160	2.700	3.240
370	0.370	0.462	0.555	0.647	0.740	0.832	0.925	1.017	1.110	1.202	1.295	1.480	1.850	2.220	2.775	3.330
380	0,380	0.475	0,570	0,665	0.760	0.855	0.950	1.045	1.140	1.235	1.330	1.520	1.900	2.280	2.850	3.420
390	0.390	0.487	0.585	0.682	0.780	0.877	0.975	1.072	1.170	1.267	1.365	1.560	1.950	2.340	2.925	3.510
400	0.400	0.500	0.600	0.700	0.800	0.900	1.000	1.100	1.200	1.300	1.400	1.600	2.000	2.400	3.000	3.600
410	0.410	0.512	0.615	0.717	0.820	0.922	1.025	1.127	1.230	1.332	1.435	1.640	2.050	2.460	3.075	3.690
420	0.420	0.525	0.630	0.735	0.840	0.945	1.050	1.155	1.260	1.365	1.470	1.680	2.100	2.520	3.150	3.780
430	0.430	0.537	0.645	0.752	0.860	0.967	1.075	1.182	1.290	1.397	1.505	1.720	2.150	2.580	3.225	3.870
440	0.440	0.550	0.660	0.770	0.880	0.990	1.100	1.210	1.320	1.430	1.540	1.760	2.200	2.640	3.300	3.960
450	0.450	0.562	0.675	0.787	0.900	1.012	1.125	1.237	1.350	1.462	1.575	1.800	2.250	2.700	3.375	4.050
460	0.460	0.575	0.690	0.805	0.920	1.035	1.150	1.265	1.380	1.495	1.610	1.840	2.300	2.760	3.450	4.140
470	0.470	0.587	0.705	0.822	0.940	1.057	1.175	1.292	1.410	1.527	1.645	1.880	2.350	2.820	3.525	4.230
480	0.480	0.600	0.720	0.840	0.960	1.080	1.200	1.320	1.440	1.560	1.680	1.920	2.400	2.880	3.600	4.320
490	0.490	0.612	0.735	0.857	0.980	1.102	1.225	1.347	1.470	1.592	1.715	1.960	2.450	2.940	3.675	4.410
500	0.500	0.625	0.750	0.875	1.000	1.125	1.250	1.375	1.500	1.625	1.750	2.000	2.500	3.000	3.750	4.500

XUM

Journalog

No. 29

A FEATURE OF THE OIL AND GAS JOURNAL

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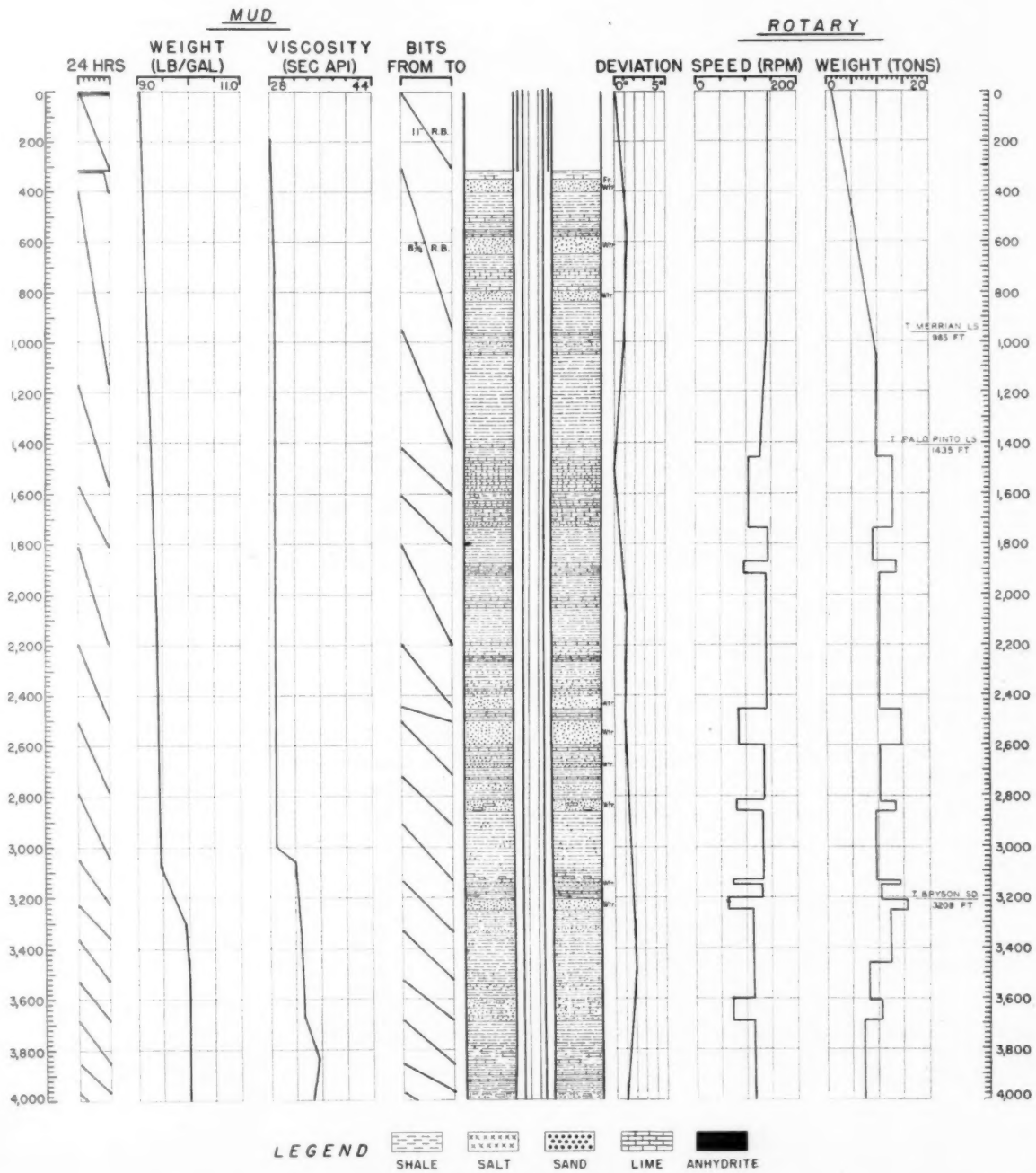
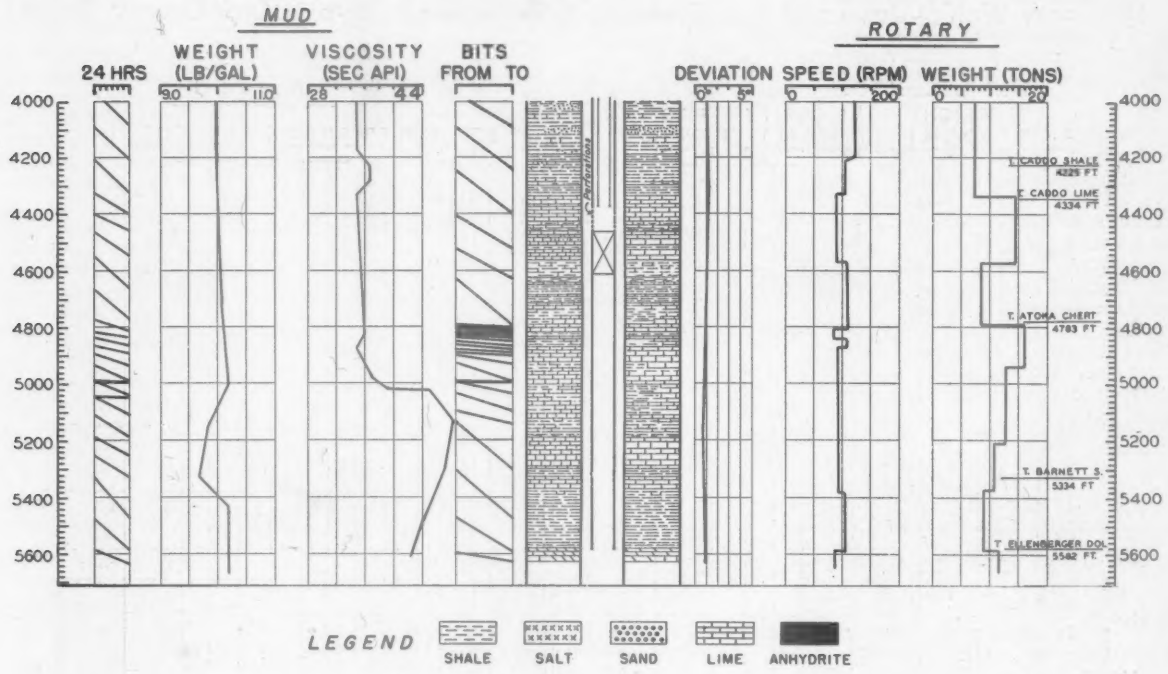
Discovery Well of Unnamed Pool (Probably to Be Called Jermyn) in Jack County, Texas



(Continued on Next Page)

Journalog

Discovery Well of Unnamed Pool (Probably to Be Called Jermyn) in Jack County, Texas (Continued)



DRILLING DATA

	Days
Rigging up and building roads	3
W.O.C., surface pipe	1
Pay string	3
Drilling and setting surface pipe	1
Drilling under surface pipe to casing point	40
Drilling	26
Trips	4.75
Repairs	1.5
Stuck pipe	2.25
D.S.T. and El. log	1.5
Deviation tests, jetting pits, etc.	1.0
Circulating	2.0
Running casing	1.0
	40.0

Drill-stem tests	4,357-5,587 ft.
Electric log	307 to 5,638 ft.
Bridge plug	4,480 ft.

BITS USED

No.	Type	Size
1	R.B.	11-in.
42	R.B.	6¾-in.

CASING RECORD

Size	Weight	Type	Depth	Cement
8⅝ o.d.	....	SH	307	125
4½ o.d.	9.5	SS	5,586	600
2	....	EUE	4,367	...

ACID

	Gal.
Ellenburger	2,000
Caddo	2,000
	2,000
	4,000

PERFORATIONS

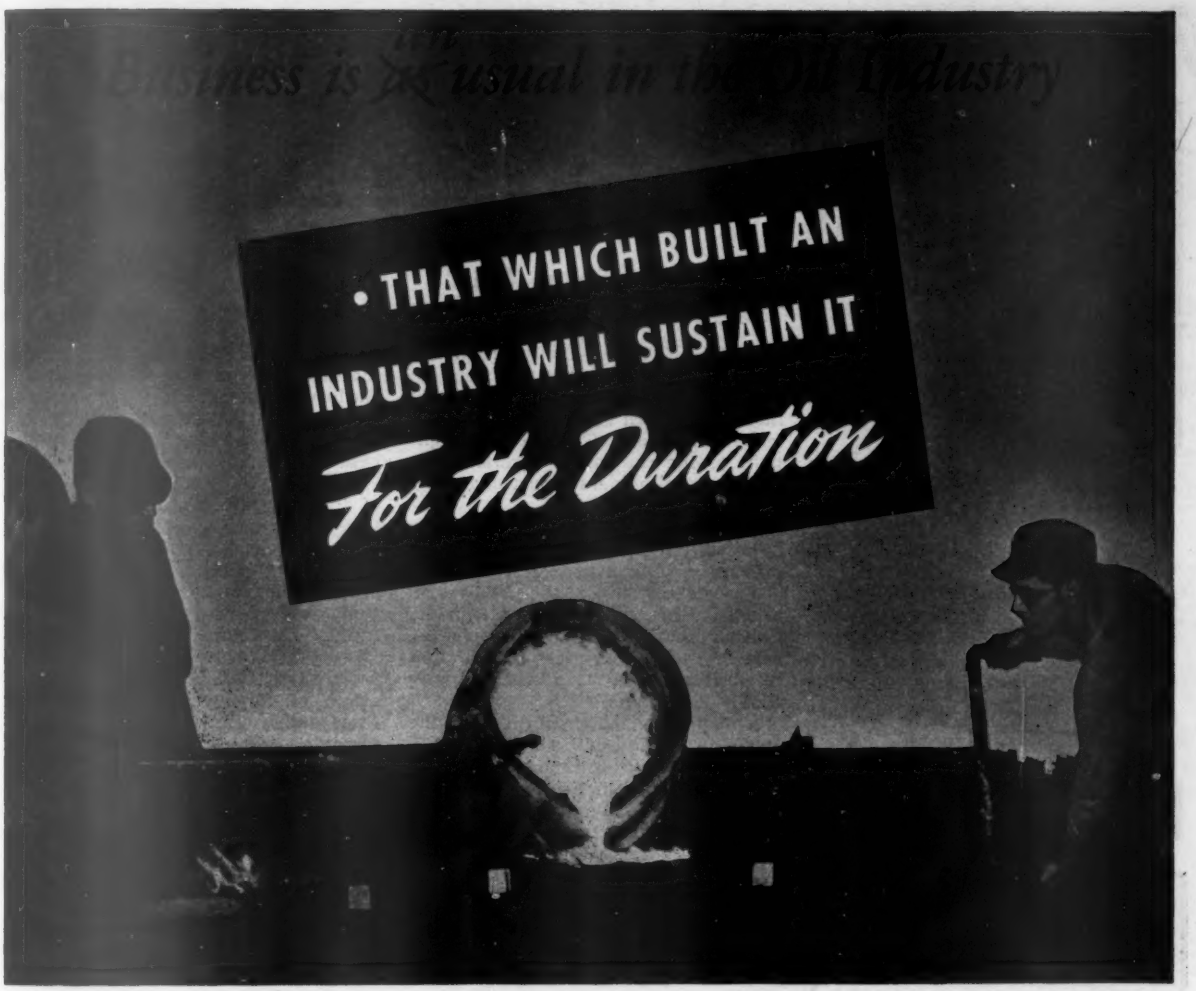
Total 165 in eight runs.

COMPLETION DATA

Total days completing		32
Displacing mud, swabbing, acidizing and testing Ellenburger		4
Plugging back and completing in Caddo lime pay		16.5
Killing well	1.5	
Perforating, squeezing and drilling out	6.0	
Waiting on cement	7.0	
Acidizing	2.0	
	16.5	
Testing		4.0
Reperforating and retreating		2.0
Testing		5.5

POTENTIAL TEST

24-hr., 2-in. open tubing: 69 bbl., 40° gr. oil., 15 bbl. water.



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REFINING

National's Aviation Unit To Be Finished This Year

FINDLAY, Ohio.—Construction will be completed here late this year on National Refining Co.'s aviation-gasoline plant which is being built by Defense Plant Corp. This was the highlight of the company's annual statement to stockholders concerning manufacturing operations.

In order to operate the Findlay aviation-gasoline plant at maximum efficiency, it was necessary to modernize certain units at the Coffeyville, Kans., refinery, the statement said. Coffeyville improvement will increase capacity of the crude unit at that plant from 9,000 to 12,000 bbl. per day.

At Findlay, modernization of the crude-distillation unit, started in 1941, was completed and the remodeled plant's capacity increased from 6,000 to 9,000 bbl. daily. Construction of a selective-catalytic polymerization unit was completed in January this year. The poly unit was designed to produce codimer, a critical war product, which ultimately serves, after further processing, as an important blending agent for aviation gasoline.

Ban on Fuel Oil Lifted For Nonheating Purposes

WASHINGTON, D. C. — All prohibitions on the use of fuel oil for nonheating purposes in District 1 have been lifted except that the ban still applies to consumption in the generation of electric power.

A joint announcement by the Office of Price Administration and the Petroleum Administration for War lifted the restrictions as of April 1, but at the same time PAW issued Supplemental Order 1 to Petroleum Distribution Order 3 continuing the restriction as to electric generators of 100 kw. or more, thus continuing curtailment of deliveries of fuel oil in an effort to force conversion to other fuels unless this is found to be impossible.

The reduction contained in the orders which lapse April 1 applied to rations for the first 3 months of 1943 and was limited to the 17 eastern states and the District of Columbia. In order to carry out the reduction, OPA ordered the necessary coupons removed from ration sheets.

The majority of the nonheating rations expire on April 1, and those

Sketches of Plant Operators

HENRY G. McBURNEY, chief of the testing group in Standard Oil Co. of New Jersey's technical service division at Bayway, N. J., has been promoted and assigned expanded responsibilities at the company's Baltimore, Md., refinery. He has been placed in charge of crude-oil distillation, catalytic and thermal cracking, alkylation, treating and attendant facilities.

Since graduating from Virginia Polytechnic Institute in 1925, Mr. McBurney has been employed by Standard Oil Co. (New Jersey) affiliated and subsidiary companies. He entered company service as a student engineer and, in May 1926, he was assigned to the technical service division.

He was transferred to Standard Franco-Americaine de Raffinage at Port Jerome, France, in February 1934, where he became technical assistant to the refinery manager.

In August 1936 he returned to the Bayway technical service division and continued on this assignment, engaging in various development and operational functions, until transferred recently to the Baltimore refinery.

rations cut by the order will be restored to their original level when they are renewed after that date, OPA stated.

In instances where the allotment expires later, the local board will increase to its original level that portion of the ration issued for use between April 1 and the date of expiration.

PAW Given Authority Over Two Supply Orders

WASHINGTON, D. C.—Administration of two orders affecting petroleum products was transferred to the Office of the Petroleum Administrator for War last week by amended versions of the orders which authorize PAW to take any action with respect to the orders which may be taken by the War Production Board.

The two orders are M-188 (petroleum sulfonates) and M-258 (mineral oil polymers).

South Dakota Increases Tractor-Fuel End Point

The state chemist of South Dakota advises that the regulation pertaining to the end point of tractor fuel has been increased from 500° to 525° F., effective April 1.

However, it has been pointed out that all shipments of this product into the state having an end point of 525° F. prior to this date will not be rejected. The blue dye color requirement and the other specifications remain the same.

PAW Issues New Asphalt Specifications

WASHINGTON, D. C.—A new list of specifications of the grades of asphalt permitted to be manufactured was issued March 20 by the Petroleum Administration for War as Petroleum Directive 66, replacing Directive 61. The text of the new directive is as follows:

[Petroleum Directive 66]

Part 1527—Marketing Asphalt

The most effective utilization of petroleum requires that the number of grades of asphalt be limited to the minimum necessary to fulfill essential civilian and war demands, contributing thereby to the best use of the transportation and storage facilities available for asphalt; and the following operating directive is deemed necessary and appropriate, to promote the national defense, and to provide adequate supplies of petroleum for military and other essential uses:

§ 1527.1 **Petroleum Directive 66**—

(a) **Manufacture of asphalt.** No asphalt or asphaltic products for paving purposes or dust palliatives other than the grades specified in paragraph (b) shall be manufactured after the effective date of this directive.

(b) **Grades of asphalt.** The grades of asphalt and asphaltic products for paving purposes which may be manufactured after the effective date of this directive are:

Asphalt cements:

Penetration Ranges—50-60, 60-70, 85-100, 120-150, 150-200, *200-300.

Federal Specifications—†SS-A-706a (November 26, 1940) and SS-R-406a (April 25, 1942).

Medium curing cutback asphalts:
MC-1, MC-2, MC-3, MC-5.

Federal Specifications—SS-A-671a (June 20, 1941) and SS-R-406a (April 25, 1942).

Rapid curing cutback asphalts:
RC-1, RC-2, RC-3, RC-5.

Federal Specifications—SS-A-671a (June 20, 1941) and SS-R-406a (April 25, 1942).

Emulsified asphalts:
Any grade manufactured from base stocks provided for in this directive.

*Same specifications as 150-200 penetration asphalt except that the softening point shall be 90°-125° F., and penetration at 77° F., 100 g., 5 seconds, shall be 200-300.

†The test, Organic Matter Insoluble, may be waived.

(c) **Special provisions.** (1) At the option of the purchaser, the Heptane-Xylene Equivalent Spot Test as set forth in Specification A.A.S.H.O. designation T102-42 (using a minimum of 15 per cent xylene with normal heptane) may be required in addition to federal specifications.

2. Except as provided in paragraph (c) (1), no refiner or processor of asphalt and asphaltic products for paving purposes shall be required to meet any material test not provided for in the federal specifications.

(d) **Exceptions.** (1) Crack filler, joint filler, cold patch, lump or powdered asphalt and zone marking paint may be manufactured only when such products are to be transported from a refinery by means other than tanker, barge, tank car, tank truck or tank truck trailer.

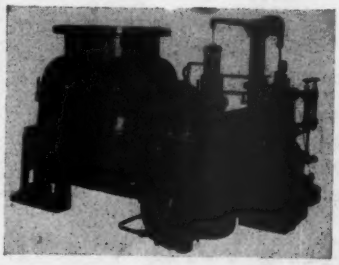
2. Flux oil may be manufactured only when such flux oil is to be used in connection with lump or powdered asphalt exclusively for plant mix paving mixtures.

(e) **Communications.** All communications concerning this directive, shall, unless otherwise directed, be addressed to: the Director of Marketing, Petroleum Administration for War, Interior Building, Washington, D. C. Ref: PD 66.

(f) **Area of applicability.** This directive shall apply to the continental United States.

(g) **Revocation of Recommendation 61.** Sections 1504.112 to 1504.115 inclusive (Recommendation 61) (7 FR 9737) are hereby revoked.

MURRAY
STEAM TURBINES FOR
REFINERIES



Type UV multistage turbine. Low pressure condensing design adapted for air conditioning centrifugal compressor drive. Includes variable speed oil pump oil relay governor. Steam inlet size is 10" and exhaust outlet 30".

MURRAY IRON WORKS COMPANY
BURLINGTON IOWA

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"We've had an Addition to the Family!"

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. . . a whopping big addition to Ohio Return Bend Capacity

A great increase in machining facilities for the manufacture of Ohio Return Bends and Special Refinery Fittings is provided by the new Machine Shop addition shown here.

This means that more Ohio Fittings can be made to meet the ever-increasing demand for these parts in AVIATION GASOLINE, BUTADIENE AND TOLUENE Production—three most important items for the tools of war.

Let these greater Ohio service facilities help you maintain your construction schedules.

Full information on designs and alloy steels for your condition of operation will be given on request.

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LIMA, OHIO · SPRINGFIELD, OHIO

Natural Gasoline

N.G.A.A. Announces Meeting Program

The Natural Gasoline Association of America has announced its tentative program for the meeting this month at Baker Hotel, Dallas, Tex. The meeting will extend from April 14 to April 16, and will include several prepared papers and addresses by men in the industry. The presentation of the Hanlon Award is scheduled for Friday morning, April 16.

The tentative program is as follows:

Wednesday, April 14

Morning—Committee meetings.

Afternoon session:

Report of technical committee—H. H. Beeson, Sabine Valley Gasoline Co., Shreveport, La., committee chairman.

Fractional Analysis Project (results to date of comparative analyses on identical gases by 15 cooperating laboratories)—H. A. Montgomery, Hanlon-Buchanan, Inc., Gladewater, Tex.

Report of the High-Pressure Gas Division (field tests to determine standard method of sampling two-phase, high-pressure gases)—W. L. Bowser, Atlantic Refining Co., Dallas, Tex.

Proposed New Method for Obtaining Specific Gravity of Distillate Well Gases—D. A. Sillers, Lone Star Gas Co., Dallas.

Corrosion in Distillate Wells—T. S. Bacon, Lone Star Gas Co., Dallas.

Fractional Analysis by the Mass Spectrometer—Dr. O. L. Roberts, Atlantic Refining Co., Philadelphia, Pa.

Use of the Property of Thermal Conductivity in Fractional Analysis—Speaker to be announced.

Thursday, April 15

"Tepetate, Six Years Later"—E. O. Bennett and F. B. Haverfield, Continental Oil Co. (The account of 6 years of operation of this oil-producing and processing, pressure - maintenance project.

"The Potentialities of Alkylation and Isomerization"—Arch L. Foster, The Oil and Gas Journal. (The significance of these processes to the natural-gasoline and distillate industries.)

"The Distillate Industry in the War Program"—J. R. Butler, Cotton Valley Operators Committee. (A report on products, practices, production and possibilities.)

Afternoon session:

Address—"We Still Make Natural Gasoline"—Ray E. Miller, Hanlon-Buchanan, Inc., N.G.A.A. president.

Subject to be announced—R. C. Alden, Phillips Petroleum Co.

"Postwar Possibilities of Natural Gas and Natural Gasoline"—P. M. Raigorodsky and Dr. Frank Dotterweich, PAW Natural Gas and Natural Gasoline Division.

Friday, April 16

Morning session:

Presentation of the Hanlon Award

"Information Please" session.

Cabot Plans to Recover Isobutane at Walton Plant

MIDLAND, Tex.—Installation of facilities for recovery of isobutane is planned by Cabot Carbon Co. at its Walton natural-gasoline plant near Kermit, in Winkler County, Texas.

The Cabot company's Walton plant is currently capable of producing 45,000 gal. of natural gasoline per day. J. F. Moore, Wickett, Tex., is superintendent.

Anco Gas Corp. Installing L.P.G. Recovery Facilities

PALESTINE, Tex.—Construction is under way on facilities for higher recovery of liquefied petroleum gases, including butane and propane, at Anco Gas Corp.'s cycling plant in the Long Lake field, near Palestine, Anderson County, Texas.

The Anco plant has capacity of 50,000,000 cu. ft. of gas per day. H. U. Jarrett is general superintendent and M. R. Riles is chief engineer and chemist.

Three South Texas Plants Add Butane-Propane Units

CORPUS CHRISTI, Tex.—Facilities for recovery of butane and propane are being installed by the Chicago Corp., operator of two large cycling plants in the Stratton and Agua Dulce fields, Nueces County, Texas. Completion of the construction program is anticipated in May. Similar butane-propane recovery equipment is being installed by Gulf Plains Corp., which also has a large cycling plant in the Agua Dulce field.

Each of the Chicago Corp.'s two plants has capacity for treating 120,000,000 cu. ft. of gas daily and that of Gulf Plains Corp. is a 125,000,000-cu. ft. installation.

Facilities being installed by Chicago Corp. will recover 720 bbl. daily of butane and 650 bbl. of propane at one plant while the other will produce 720 bbl. of butane and 600 bbl. per day of propane.

The Gulf Plains Corp. plant will produce 730 bbl. per day of butane and 620 bbl. of propane.

Natural Gas

One of Five New Helium Plants Starts Operations

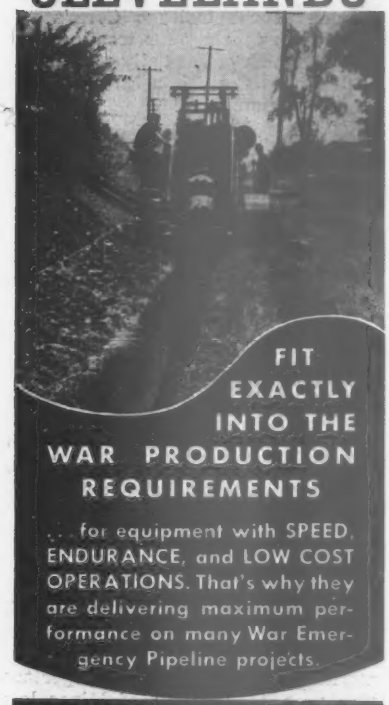
WASHINGTON, D. C.—Marking a tremendous increase in the output of vital helium for the Navy's antisubmarine blimps and other important war uses, the Bureau of Mines last week shipped the first carload of helium from its new and largest helium plant "somewhere in Texas" and announced simultaneously that work is being rushed on four other similar plants to bring the production rate of the noninflammable gas for 1943 to about 40 times that of prewar days.

In reporting to Secretary of the Interior Harold L. Ickes on the progress of the bureau's $16,000,000 helium-expansion program, Dr. R. R. Sayers, director, said that the four additional plants, now in various stages of construction, are located "in the Southwestern area" and that by the end of this year the bureau will have a total of six plants turning out helium for war needs.

Until the new Texas plant was placed in operation, the bureau had been supplying helium from its facilities at Amarillo, Tex. The Amarillo plant, built by the bureau in 1929, has been expanded considerably in the past several months and today is producing at a rate five times greater than at the outbreak of the war, Dr. Sayers reported.

On its initial runs, the new Texas plant is operating at less than capacity so that equipment will be "broken in" properly, Dr. Sayers said. Processing units still are being added and when these are installed the plant will reach its rated capacity, which is larger than the Amarillo facilities. Two of the four uncompleted plants each will have an output equal to the Amarillo plant and two will be about half as large.

"CLEVELANDS"


FIT
EXACTLY
INTO THE
WAR PRODUCTION
REQUIREMENTS
. . . for equipment with SPEED, ENDURANCE, and LOW COST OPERATIONS. That's why they are delivering maximum performance on many War Emergency Pipeline projects.
THE CLEVELAND TRENCHER COMPANY

More pipe-line information is published each week in the Journal

More pipe-line men subscribe to the Journal

More manufacturers of pipe-line equipment advertise in the Journal

3 reasons why The Oil and Gas Journal is considered first in the pipe-line industry.

PIPE LINES

Right-of-Way Acquired for East Ohio 20-In. Line.

CLEVELAND, Ohio.—The East Ohio Gas Co., Cleveland, is taking right-of-way for the 120-mile 20-in. gas line which will connect with the Panhandle Eastern Pipe Line Co.'s Detroit system near Maumee, Ohio.

The new 20-in. will cross the northern part of Ohio and connect with the trunk system of East Ohio running from West Virginia near Brecksville.

J. French Robinson, president of the East Ohio, this week calculated that the Panhandle Eastern connection would permit acquisition of 50,000,000 to 100,000,000 cu. ft. of gas daily. The added volume is needed by East Ohio to maintain its service to a large number of war plants in the Cleveland-Youngstown area and to continue essential civilian supplies.

Youngstown Sheet & Tube Co. has been awarded an order for 22,500 tons of 20-in. pipe for the East Ohio project, amounting to approximately $1,600,000. Bids on construction of the line were received last week. Cost of construction will be approximately $3,000,000.

Third Line May Be Backed By Legislative Support

WASHINGTON, D. C.—Legislation calling for construction of a third big-inch line from the Southwest producing area to the East Coast will be introduced in Congress in the near future. Plans to offer such legislation were outlined here last week by Rep. Edith Nourse Rogers of Massachusetts.

In a report 2 weeks ago to the Senate Truman committee, Petroleum Administrator Ickes said it was "conceivable we might need a third big pipe line" but all reference to another project has been vague.

New Great Lakes' Feeder To Be Finished May 31

WASHINGTON, D. C.—Completion of a 4-in. products line from the Kanotex Refining Co.'s plant at Arkansas City, Kans., to Ponca City, Okla., where it will deliver from 3,000 to 4,000 bbl. of gasoline daily to the Great Lakes Pipe Line Co., is scheduled by May 31.

The Petroleum Administration for War last week broke official silence on the project and disclosed that the new line will cost about $154,789 and will provide Kanotex with a pipe-line outlet for its products in the Great Lakes area.

The 32-mile 4-in. system will include one pumping station and two 55,000-bbl. tanks will be erected at Ponca City to handle the traffic. The line will relieve 150 tank cars for other service, it was estimated before the War Production Board committee which approved the project March 1.

C. D. Winkelman Becomes Superintendent of Bayou

HOUSTON, Tex.—C. D. Winkelman, who was assistant to the vice president of Shell Pipe Line Co., is now general superintendent of the Bayou System pipe line extending from Baytown, Tex., to Baton Rouge, La., where it connects with the Plantation line to Greensboro, N. C. By directive of War Emergency Pipelines, Inc., Shell will operate the Bayou line, which is owned jointly by Shell, Humble Pipe Line Co., Pan American Pipe Line Co., Pure Oil Co., Sinclair Refining Co., and Texas Pipe Line Co. Mr. Winkelman's headquarters are in Houston.

S. B. Bean is division superintendent at Baytown; W. H. Craddock, division superintendent at Opelousas, La., and G. H. Miller, dispatcher, Houston.

Pipe-Line Movement Of Gasoline Rising

WASHINGTON, D. C.—Movement of gasoline by pipe lines in January increased 9 per cent over the volume so transported a year earlier but declined slightly from December 1942, the Bureau of Mines reported here last week.

Motor fuel turned into lines in January totaled 11,020,000 bbl., against 10,122,000 bbl., in January 1942. In December 1942 the total gasoline handled by pipe lines was 12,430,000 bbl., in January 1941, pipe lines moved 8,816,000 bbl.

Motor fuel delivered from lines in January this year totaled 9,909,000

bbl., against 9,151,000 bbl., in January 1942, an increase of 8.28 per cent, and compared with 7,683,000 bbl. in January 1941. Stocks in lines and working tanks at the end of January totaled 7,617,000 bbl., against 6,572,000 bbl., a month earlier and 7,294,000 bbl., a year earlier.

Tennessee Project Requests Time to Complete Report

ASHLAND, Ky.—Reports reaching here from Nashville, Tenn., reveal that the Tennessee State Railway and Public Utilities Commission took under advisement last week a request by the Tennessee Gas & Transmission Co. for an extension of time in which to present financial plans for a proposed pipe line.

The line would go through Tennessee, connecting Louisiana with Ashland, Ky., according to Utilities Commissioner Porter Dunlap of Tennessee. He stated that the commission has reserved its opinion pending action of the Federal Power Commission which is now considering the case.

Another Tennessee report says a certificate of convenience and necessity has been granted the Kentucky-Tennessee Natural Gas Corp. Mr. Dunlap said the proposed pipe lines would serve eastern Tennessee.

Whether such lines will be laid or not depends on the decision of the War Production Board as to the allocation of pipe-line materials to the corporation according to C. M. Coleman, representative of the corporation, speaking at Nashville.

Mr. Dunlap, in explaining the aims of the corporation cited plans to construct facilities from Knox County, Kentucky, to serve Aluminum Co. of America at Alcoa, Tenn.

A survey for the proposed Ashland-Louisiana pipe line was made many months ago.

Ione Star Products Line To Ranger Is Completed

RANGER, Tex.—Sharman & Allen, pipe-line contractors, have completed a 25-mile 4½-in. gasoline line which will ship gasoline from Breckenridge to the Lone Star Gasoline Co. fractionating plant at Ranger, Tex. The line is owned by Lone Star interests.

District 2 Transportation Problems Get Attention

Some relief may be given to the strain on pipe line facilities delivering crude oil from District 2 as the result of certain recent developments.

Deliveries of 35,000 to 38,000 bbl. daily from the WEP 24-in. system to northern pipe lines at Enfield, Ill., it has been pointed out, may have a favorable effect indirectly. Proposals have been made, according to reports, that some empty tank cars returning from the East Coast to Texas be routed via Oklahoma to move Mid-Continent crude desired for refining lubricating oil on the Gulf Coast. Stanolind Pipe Line Co. is engaged in a looping program, soon to be completed, which will increase capacity by 10,000 bbl. daily for moving crude oil from Texas across Oklahoma.

Independent Pipe Line Permit Is Extended

Independent Pipe Line Co. of Falls City, Neb., has been given a 1-year extension of its authority to operate as a transporter of crude oil in Gage, Pawnee, Nemaha, Johnson, Otoe and Cass counties, all in Nebraska. Last year the company was granted authority to construct pipe lines in those counties, but the war prevented construction. Oil has been found thus far only in Richardson County.

Private Companies Will Operate ODT Oil Barges

WASHINGTON, D. C.—The Office of Defense Transportation has announced that the fleet of 500 wooden petroleum tank barges, 21 tow boats and 100 tugboats now under construction to step up the flow of oil to the east will be operated by private companes on a charter basis.

The first of the barges was launched March 20 at Ocean City, N. J., and the rest of the building program will be completed by October 30, according to the Corps of Engineers, U. S. Army, which is directing the construction.

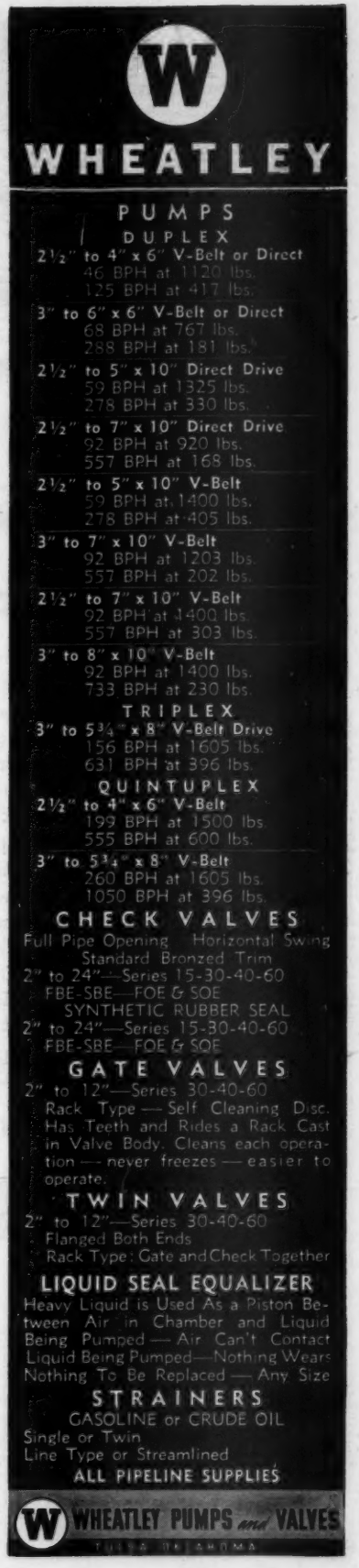
A three-member committee will allocate the units and designate the points of operation giving private companies already in the towing business first opportunity to charter the equipment. Applications will be submitted to the ODT.

The committee will recommend to DPC the rate to be charged for the rental of the craft. Each tug and towboat, with its complement of barges, will be chartered as a unit.

Designed to move 100,000 bbl. of residual fuel oil a day to the east, the boats will be completely equipped and delivered ready for operation.

The first barges and tugboats to be launched will operate on the Gulf intracoastal waterway from New Orleans, La., to Panama City, Fla., and along the Atlantic intracoastal waterway.

The ODT said that 25 steel barges already are in operation moving petroleum products along the Gulf intracoastal waterway to Carrabelle, Fla., to await opening of the trans-Florida pipe line.


WHEATLEY
PUMPS
DUPLEX
2½" to 4" x 6" V-Belt or Direct
46 BPH at 1120 lbs.
125 BPH at 417 lbs.
3" to 6" x 6" V-Belt or Direct
68 BPH at 767 lbs.
288 BPH at 181 lbs.
2½" to 5" x 10" Direct Drive
59 BPH at 1325 lbs.
278 BPH at 330 lbs.
2½" to 7" x 10" Direct Drive
92 BPH at 920 lbs.
557 BPH at 168 lbs.
2½" to 5" x 10" V-Belt
59 BPH at 1400 lbs.
278 BPH at 405 lbs.
3" to 7" x 10" V-Belt
92 BPH at 1203 lbs.
557 BPH at 202 lbs.
2½" to 7" x 10" V-Belt
92 BPH at 1400 lbs.
557 BPH at 303 lbs.
3" to 8" x 10" V-Belt
92 BPH at 1400 lbs.
733 BPH at 230 lbs.
TRIPLEX
3" to 5¾" x 8" V-Belt Drive
156 BPH at 1605 lbs.
631 BPH at 396 lbs.
QUINTUPLEX
2½" to 4" x 6" V-Belt
199 BPH at 1500 lbs.
555 BPH at 600 lbs.
3" to 5¾" x 8" V-Belt
260 BPH at 1605 lbs.
1050 BPH at 396 lbs.
CHECK VALVES
Full Pipe Opening Horizontal Swing
Standard Bronzed Trim
2" to 24"—Series 15-30-40-60
FBE-SBE—FOE & SOE
SYNTHETIC RUBBER SEAL
2" to 24"—Series 15-30-40-60
FBE-SBE—FOE & SOE
GATE VALVES
2" to 12"—Series 30-40-60
Rack Type—Self Cleaning Disc. Has Teeth and Rides a Rack Cast in Valve Body. Cleans each operation—never freezes—easier to operate.
TWIN VALVES
2" to 12"—Series 30-40-60
Flanged Both Ends
Rack Type: Gate and Check Together
LIQUID SEAL EQUALIZER
Heavy Liquid is Used As a Piston Between Air in Chamber and Liquid Being Pumped—Air Can't Contact Liquid Being Pumped—Nothing Wears Nothing To Be Replaced—Any Size
STRAINERS
GASOLINE or CRUDE OIL
Single or Twin
Line Type or Streamlined
ALL PIPELINE SUPPLIES
WHEATLEY PUMPS and VALVES
TULSA OKLAHOMA

Plenty Tough...

but it still needs Lubrication

Wham! The bouncing jeep refuses to be stopped. And one big reason is: The boys keep it in fighting trim with *regular* lubrication. Give your wire rope the same care and its resistance to destruction will also be something to talk about.

When wire rope leaves the factory it is lubricated clear through. Inside wires bear on each other with minimum friction as they bend around drum or sheave. If it's a hemp center rope, the saturated core feeds more lubricant to wires and strands as loads are applied. The lubricant on outer wires checks dirt and moisture, too.

But weather, pressure, heat and corrosion will eventually exhaust the protection unless the lubricant has been *renewed* in time. A dry core or rusted inner wires won't be visible to the eye. So, if it's sound to "grease" jeeps and trucks at stated intervals in order to *prevent* damage, it's sound to do the same for wire rope.

A good lubricant penetrates to the core and still has viscosity to cling to individual wires. Major oil companies make excellent products for this purpose. Get a supply and use it regularly. If you wish detailed lubrication instructions or any other assistance in conserving rope, feel free to call on B & B engineers. Remember . . . Uncle Sam will thank you for making your wire ropes *last longer.*

BRODERICK & BASCOM ROPE CO., ST. LOUIS

Branches: New York, Chicago, Houston, Portland, Seattle
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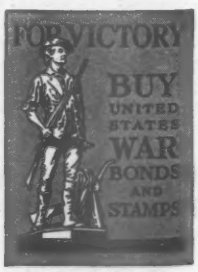
YELLOW STRAND PREFORMED WIRE ROPE



A MAINSTAY OF WAR PRODUCTION

Exploration and Drilling

Week's Highlights

THERE is a tendency at this time to consider the present low price of crude as a governmental imposition. It is true that crude prices were generally frozen at the October 1941 level and this level was very low. However, it was the level established at that time as a result of the operation of the law of supply and demand as it had functioned during the period immediately preceding the fall of 1941.

In an article beginning on page 14 of this issue, it is shown that the price of crude tends to rise with a decline in the ratio of reserves to production but that this conformity has not been observed since 1939. Other factors intervened to prevent it. From July 1937 to July 1938, production in Illinois rose from around 500,000 bbl. a month to 1,500,000 bbl. During the next year, this figure was multiplied five-fold and in July 1940 it was again doubled, making a peak of 15,000,000 bbl. a month. There was a decline of about 35 per cent during the early part of 1941 but a second peak of over 12,000,000 bbl. was recorded in September.

The flood of oil coming from the Illinois basin during 1939 and 1940 was sold below a fair price for Mid-Continent crude and at the beginning of 1941 was still available at $1.15 per barrel, or 13 cents above the price of 36° Mid-Continent crude. The transportation costs on this crude put the price at Ohio refining centers at a higher level for Mid-Continent crude than for Illinois oil. Obviously, this prevented any general rise for Mid-Continent crude.

During the early part of 1941, Illinois prices rose 22 cents and Mid-Continent prices rose 15 cents, wiping out some of the favorable differential enjoyed by Mid-Continent producers but the second flood of oil coming from newly discovered Illinois fields prevented any further increase.

It thus appears that the existing distress among operators in the Mid-Continent as well as in Illinois, is due to a great extent to those whose activities permitted, or even encouraged, overproduction in Illinois. It was freely stated at that time that Illinois operators were unsettling the markets and that the lack of production control in Illinois was affecting adversely operators in every other section of the country. It was predicted that Illinois' production would decline rapidly from current levels. It now stands at less than half the peak level of 1940 and state officials predict that every field in the state will be at the stripper stage in 3 years.

Of course, the freeze was not anticipated but there is some question regarding the effect that anticipation of constant prices would have had on Illinois production. It is quite conceivable that operators would still have got theirs while the getting was good.

WEST TEXAS: A north outpost to Slaughter, 2 miles from production, is swabbing oil from the regular pay. Production on the east side of Fullerton remains high and a 2-mile east outpost to Emma is running structurally high (p. 66).

CALIFORNIA: A new gas field is in prospect in San Joaquin County and a second probable gas pay has been found in the Mendota area. A nearly depleted pumper in the Ventura Avenue field suddenly began flowing 550 bbl. of 27.9° oil (p. 78).

NORTH TEXAS: An offset to the Simpson sand discovery in the Mueller pool found Caddo lime production (p. 71).

CANADA: Underwater drilling is being started in Lake Erie and offshore from Prince Edward Island in the Gulf of St. Lawrence (p. 83).

ILLINOIS: Levias production is reported in a Franklin County test 5 miles south of Benton (p. 68).

COMPLETIONS IN ALL FIELDS . . .

(Week ended March 27, 1943)

	Oil	Gas	Dry	Total	Footage	Total comp. to date 1943	1942
N. Y., Pa., and W. Va.	46	10	0	56	108,528	688	869
Ohio	1	4	3	8	21,014	203	223
Indiana	2	0	5	7	14,222	63	77
Kentucky	2	12	4	18	50,043	61	58
Illinois	22	0	14	36	97,448	420	411
Michigan	4	0	7	11	27,417	94	152
Kansas	19	0	10	29	88,146	300	344
Nebraska	1	0	1	2	5,052	6	12
Missouri, Iowa	0	0	0	0	0	3	4
Oklahoma	10	3	10	23	84,499	254	356
Texas:							
North Central Texas	11	0	7	18	64,562	259	349
West Texas	16	0	5	21	84,754	195	464
Texas Panhandle	2	1	0	3	8,571	43	139
Eastern Texas	5	0	1	6	28,731	58	119
Texas Gulf Coast	4	0	1	5	32,693	86	210
Southwest Texas	6	1	8	15	62,270	191	327
Total Texas	44	2	22	68	281,581	832	1,608
North Louisiana	2	1	4	7	35,046	67	134
Louisiana Gulf Coast	2	0	1	3	31,546	78	143
Total Louisiana	4	1	5	10	66,592	145	277
Arkansas	3	0	1	4	20,485	51	34
Mississippi and Southeast	0	0	0	0	0	11	17
Montana	1	3	1	5	6,584	36	34
Wyoming	1	0	0	1	4,542	26	22
Colorado, Utah	1	0	0	1	6,600	3	4
New Mexico	2	0	3	5	14,078	49	64
California	14	1	5	20	63,096	231	222
Total United States	177	36	91	304	969,927	3,476	4,788
Total previous week	142	28	88	258			
Week ended March 28, 1942	174	30	84	288			

PERMIAN BASIN, PANHANDLE

Two-Mile North Extension of Slaughter Pool Indicated

MIDLAND, Tex. — The Slaughter pool, Hockley and Cochran counties, second largest in the state and one of the largest in area in the world, seemed to be further enlarged last week when J. C. Hawkins 14-B Mallet Land & Cattle Co., 580 ft. from south and east Labor 23, League 46, Edwards County School Land, was swabbing 4 bbl. per hour after acid treatment of 12,000 gal. at plugged-back depth 4,900 ft. The well had been drilled to a total depth of 4,929 ft., treated with 4,000 gal. acid, and flowed 13 bbl. per day with some water before being plugged back. Casing had been perforated with 135 shots from 4,850-95 ft., and top of saturated lime was at 4,849 ft. Successful completion would extend the field 2 miles north.

Andrews County.—Another large well for the Fullerton pool was assured when Texas Pacific Coal & Oil 2 Emily Jackson, on the east side of the pool, flowed at the rate of 80 bbl. per hour after second acid treatment of 6,000 gal. More pay was being drilled before final completion. Skelly Oil 1-K University, SW SW Section 28, Block 9, University Survey, 2 miles east of Emma pool, elevation 3,189 ft., topped Yates sand at 2,970 ft., Brown lime at 3,911 ft., maintaining favorable structural position, and was drilling below 4,200 ft. If unproductive in the San Andres, the test is to be carried to 7,500 ft., testing the Clear Fork horizon.

Crane County.—Gulf Oil 1 Estes, wildcat in western Crane County, plugged back from T.D. 7,777 ft. to 3,883 ft. to test the Holt horizon, was rigging up cable tools to drill plug.

Crockett County.—Moore Brothers 1 J. S. Todd, deep wildcat in Section 16, Block YZ, E.L.&R.R. Survey, was drilling ahead in Simpson formation, top not reported, after a core from 7,286-7,306 ft. recovered 18 ft. lime and shale, no shows reported. Same operators were drilling ahead at their 1-21 Shannon estate, Section 21, Block YZ, below 2,600 ft. after sulfur water rose 500 ft. in the hole from 2,540-43 ft.

Gaines County.—Stanolind Oil & Gas 15 American Warehouse Co., SE NW SE Section 5, Block H, D.&W. Survey, 11,000-ft. test in the Cedar Lake pool, was drilling below 4,800 ft.

Hockley County.—George P. Livermore, Inc., 1 G. C. Thomas, Block 29, Ellwood Sub., League 10, Donley County School Land, southeast corner of county, with elevation 3,348 ft., topped Yates at 2,850 ft., brown lime at 3,690 ft., San Andres lime at 4,040 ft., and was drilling ahead below 4,780 ft. in lime.

Howard County. W. S. Guthrie 1 Pauline Allen, SE SE Section 57, Block 20, Lavaca Navigation Survey, northeast part of county, was drilling below 2,700 ft. in brown lime. A small show of gas was recorded at 2,465-75 ft.

Lubbock County. J. R. Sharp 1 R. D. Martin, NE SE Section 18, Block D-6, 10 miles southwest of Lubbock, elevation 3,316 ft., topped brown lime at 3,420 ft., and was drilling below 4,115 ft.

Pecos County.—Brown & Hancock 1 McKay, southeast part of county in Section 32, Block 1, I.&G.N. Survey, elevation 2,146 ft., has a slight show of gas at 1,231-34 ft., and another at 1,422 ft., and was shut down for orders at T.D. 1,580 ft. in lime.

Yoakum County. — Humble Oil & Refining 1 Tannehill, SW NE Section 840, Block D, southwest part of county, elevation 3,751 ft., was drilling in lime at 5,085 ft., nearing the producing horizon of the Wasson pool, 3 miles east. The test is scheduled to 7,500 ft.

DAILY AVERAGE PRODUCTION FOR WEEK

	Mar. 27 crude oil	Mar. PAW quota all oils	Mar. 20 crude oil
Arkansas	70,850	78,700	70,800
California	780,150	823,700	780,500
Colorado	6,310	7,000	6,570
Eastern fields	95,300	115,000	93,000
Illinois	230,100	262,300	252,000
Indiana	13,750	16,500	15,000
Kansas	308,900	309,900	315,400
Louisiana	339,250	349,800	339,550
North Louisiana	*89,250*	.....	*88,950*
Louisiana Gulf Coast	*250,000*	.....	*250,600*
Michigan	56,400	63,700	55,700
Mississippi	53,700	50,000	58,300
Montana	18,490	23,400	19,690
Nebraska	2,350	2,800	1,900
New Mexico	105,000	105,800	105,600
Oklahoma	345,650	390,700	342,450
Texas	1,392,650	1,502,000	1,392,900
East Texas	*323,000*	.....	*323,400*
West Texas	*218,000*	.....	*218,100*
North Central Texas	*137,200*	.....	*137,000*
East Central Texas	*99,750*	.....	*99,800*
Texas Panhandle	*88,500*	.....	*88,600*
Texas Gulf Coast	*458,500*	.....	*458,350*
Southwest Texas	*67,700*	.....	*67,650*
Wyoming	93,320	92,500	93,540
Total United States	3,912,170	4,193,800	3,942,900
Total production Jan. 1-Mar. 27, 1943			333,312,825 bbl.
Same period last year			344,204,490 bbl.

WEST TEXAS COMPLETIONS

Wildcats

Coke County: Wm. F. Morgan 1 Lackey, SW SW Sec. 272, Blk. 1-A, H.&T.C. Ry. Sur., elev. 2,130 ft., dry, T.D. 3,748 ft., lime.

Ward County: Belfort Oil 1-W University, NW NE Sec. 14, Blk. 16, University Sur., dry, T.D. 3,110 ft.

Yoakum County: Barnsdall Oil 1 Heath, NE NE Sec. 315, Blk. D, J. H. Gibson Sur., elev. 3,649 ft., San Andres lime 4,570 ft., San Angelo lime 6,025 ft., dry, T.D. 7,600 ft., dolomite.

Fields

Embar-Permian, Andrews County: Phillips Petroleum 37 University-Andrews, NW SE Sec. 29, Blk. 10, University Sur., flow 161 bbl., 42.6 grav., pay 6,175 ft., acid 9,000 gal., T.D. 6,250 ft.

Phillips Petroleum 1 Ordovician-University, old well plugged back from T.D. 8,368 ft., elev. 3,221 ft., pump 79 bbl. oil, 11 bbl. water, pay 6,180-6,260 ft., perf., P.B. 6,261 ft.

Embar-Ellenburger, Andrews County: Phillips Petroleum 28 University-Andrews, SW SE Sec. 19, Blk. 10, University Sur., elev. 3,244 ft., flow 514 bbl., ¼-in. choke, perf. 7,995-8,006 ft., T.D. 8,010 ft.

Iatan-East Howard, Howard County: Ray Oil 1-B W. L. Foster, SE NW NW Sec. 43, Blk. 29, T-1n, T.&P. Ry. Sur., elev. 2,268 ft., I.P. 140 bbl., 8 per cent water, pay 2,730 ft., T.D. 2,760 ft.

Mascho, Andrews County: Whitaker Oil 1-B University, SE NE Sec. 22, Blk. 10, University Sur., pumped 132 bbl., pay 4,490 ft., shot 500 qt., T.D. 4,590 ft.

McCamey, Upton County: Trebol Oil 1-C R. P. Ricker, 3,107 ft. from SE, 2,078 ft. from NE Sec. 6, Blk. R, E. C. Groom Sur., elev. 2,809 ft., pump 77 bbl., pay 2,448 ft., T.D. 2,450 ft., lime.

North Cowden, Ector County: E. Constantin & Associates 1-A R. W. Smith, 880 ft. from N, 2,220 ft. from E Sec. 7, Blk. 42, T-1s, T.&P. Ry. Sur., elev. 3,037 ft., I.P. 72 bbl., pay 4,270 ft., shot 820 qt., T.D. 4,550 ft.

Carl B. King and Bay Petroleum 1-C Holt., NE NE Sec. 19, Blk. A, Public School Land, flow 158 bbl., pay 4,220 ft. lime, shot 400 qt., T.D. 4,293 ft.

Shipley, Ward County: James H. Snowden et al 11-A Wristen Bros., W¼ E¼ E¼ Sec. 18, Blk. 5, H.&T.C. Ry. Sur., I.P. 110 bbl., pay 2,470 ft., T.D. 2,496 ft.

Slaughter, Cochran County: Devonian Oil 23-A Duggan, Lab. 12, Lge. 55, Oldham County School Land, flow 1,348 bbl., pay 5,012 ft., lime, T.D. 5,049 ft.

Devonian 19-B Duggan, NE cor. Lab. 22, Lge. 55, Oldham County School Land, flow 808 bbl., pay 5,030 ft. lime, acid 12,000 gal., T.D. 5,072 ft.

Slaughter, Hockley County: L. M. Glasco 7-C Mallet, Lab. 17, Lge. 48, Edwards County School Land, flow 1,348 bbl., pay 5,012 ft., lime, T.D. 5,049 ft.

Devonian 19-B Duggan, NE cor. Lab. 22, Lge. 55, Oldham County School Land, flow 808 bbl., pay 5,030 ft., lime, acid 12,000 gal., T.D. 5,072 ft.

Slaughter, Hockley County: L. M. Glasco

7-C Mallet, NW cor. Lab. 17, Lge. 48, Edwardss County School Land, elev. 3,611 ft., flow 487 bbl., pay 4,910 ft., lime, acid 12,000 gal., T.D. 4,957 ft.

T. F. Morrow 16 Mallet, NW cor. Lab. 20, Lge. 48, Edwards County School Land, flow 510 bbl., pay 4,860 ft., lime, acid 15,000 gal., T.D. 4,972 ft.

South Cowden, Ector County: Union Oil of Calif. 1 Kone, NW SW Sec. 41, Blk. 42, T-2s, T.&P. Ry Sur., elev. 2,912 ft., pump 102 bbl. plus 33 bbl. water, pay 4,460-4,651 ft., shot 550 qt., T.D. 4,656 ft., lime.

South Shipley, Ward County: Cross Dev. 1 Monroe, E¼ E¼ S¼ Sec. 5, Blk. 5, H.&T.C. Ry. Sur., pump 65 bbl. Correction: was reported temporarily abandoned.

Walker, Pecos County: Cardinal Oil 12-J White & Baker, 330 ft. from N, 2,034 ft. from E Sec. 87, Blk. 194, G.C.&S.F. Ry. Sur., flow 67 bbl., pay 2,140 ft., shot 80 qt., T.D. 2,161 ft.

Weiner, Winkler County: Skelly Oil 55 S. M. Halley, SW NW NW Sec. 8, Blk. B-11, Public School Land, dry, T.D. 3,231 ft.

Skelly Oil 56 S. M. Halley, SW SW NW Sec. 8, Blk. B-11, Public School Land, elev. 2,811 ft., dry, T.D. 3,896 ft.

White & Baker, Pecos County: Cardinal Oil 7-L White & Baker, NE NE Sec. 90, Blk. 194, G.C.&S.F. Ry. Sur., elev. 2,851 ft., flow 59 bbl., pay 1,685 ft., shot 80 qt., T.D. 1,903 ft.

(Reported week ended March 20)

Fields

Barnhart, Reagan County: Amerada 1-RL University, NW SE Sec. 3, Blk. 48, University Sur., flow 1,350 bbl. ½-in choke, perf. 8,980-9,042 ft., T.D. 9,091 ft.

Fullerton, Andrews County: Fullerton 4-A Wilson, NE SE Sec. 16, Blk. A-32, Public School Lands, elev. 3,362 ft., flow 1,879 bbl., pay 6.745 ft., acid 24,000 gal., T.D. 7,255 ft.

Goldsmith, Ector County: Carl B. King and Bay Pet. 2-A Cummins, 440 ft. from N, 2,200 ft. from W, Sec. 32, Blk. 45-T-1-N, T.&P. Ry. Sur., I.P. 66 bbl., pay 4,231 ft., acid 4,000 gal., T.D. 4,315 ft.

Noelke, Crockett County: Texas Pacific Coal & Oil 3 fee, 1,983 ft. from W, 970 ft. from S Sec. 27, Martha Wilton Sur., elev. 2,815 ft., flow 1,742,000 cu. ft. gas, pay 1,963-73 ft., P.B. to 1,955 ft., D.D. to 1,984 ft., T.D. 2,210 ft.

Pyote, Ward County: Darby 1-B University, NE NW Sec. 18, Blk. 16, University Sur., elev. 2,615 ft., dry, T.D. 2,899 ft.

Slaughter, Cochran County: Bay Pet. 6 Humble-Mallet, 580 ft. from N and E lines Lab. 12, Lge. 52, Scurry County School Land, elev. 3,644 ft., pump 160 bbl., pay 5,035 ft., T.D. 5,060 ft. lime.

Slaughter, Hockley County: J. C. Hawkins 8-A Mallet, 580 ft., from N and E lines Lab. 34, Lge. 47, Edwards County School Land., flow 678 bbl., pay 4,920 ft., acid 11,500 gal., T.D. 4,965 ft.

T. F. Morrow 17 Mallet, 580 ft. from S and W lines Lab. 19, Lge. 48, Edwards County School Land, flow 535 bbl., pay 4,-930 ft., acid 12,000 gal., T.D. 4,962 ft.

Tobarg, Pecos County: Cardinal Oil 12 Tobarg, 1,070 ft. from S, 1,530 ft. from E Sec. 539, A.&B. Sur., elev. 2,297 ft., pump 37 bbl., pay 337 ft., T.D. 378 ft.

Wasson, Yoakum County: DeKalb Agricultural Ass'n. 1 Annie Armstrong, 555 ft. from S, 1,875 ft. from W Sec. 889, Blk. D, J. H. Gibson Sur., elev. 3,530 ft., flow 1,049 bbl., pay 4,948 ft. lime, acid 10,500 gal., T.D. 5,067 ft.

Devonian Oil 3 Ruth Bennett, NW NE Sec. 631, Blk. D, J. H. Gibson Sur., flow 403 bbl., pay 5,197 ft., acid 11,000 gal. T.D. 5,285 ft.

SOUTHEAST NEW MEXICO

HOBBS, N. M.—Two new wildcats were announced for Lea County last week. Mascho Oil Co. 1 State will be

(Continued on Page 92)

EASTERN TEXAS FIELDS

Franklin County Test Shows Porosity in Rodessa Zone

DALLAS, Tex.—Tide Water Associated Oil Co. and Seaboard Oil Corp. 1 Bacon, Maximillian Survey, was drilling below 7,548 ft., after showing porosity in the Rodessa zone from 7,279-7,304 ft. and 7,286-99 ft. Elevation of the test is 435 ft., Woodbine sand was topped at 4,010 ft., Paluxy at 5,732 ft., and Glen Rose at 6,159 ft.

Anderson County. — Byrd-Frost, Inc., 1 Mrs. J. F. Marsh, J. E. Box Survey, 2 miles northwest of Elkhart, 5,300-ft. wildcat, elevation 359 ft., was drilling below 1,500 ft. The Cayuga field received the first completion in several months at Tide Water and Seaboard 1 Harton, which flowed 67.55 bbl. per day from Woodbine sand.

Cass County.—The Kildare pool is stepping out in East Texas activity, with two new locations staked this week, and two wells completed. The pool has nine locations, two wells drilling, and one well waiting on production test.

Cherokee County. — McMillan & Nathan 1 Huggins, Rusk area, elevation 376 ft., topped Austin chalk at 4,781 ft. and was drilling below 4,800 ft.

Hunt County.—Humble 1 F. F. Graham, William Elam Survey, 1 mile west of Weiland pool, Smackover lime test, has elevation of 530 ft., topped Austin chalk at 1,958 ft., and was drilling below 3,200 ft. without reporting top of Woodbine. Stanolind 1 Tilson heirs, C. C. Dale Survey, 1¾ miles northwest of Campbell, Paluxy sand test, elevation 625 ft., Woodbine 3,590 ft., Georgetown lime 3,960 ft., was drilling lime at 4,316 ft.

Leon County.—Albert Plummer 1 Lulu Henry, Robert Rogers Survey, 21 miles northeast of Normangee, topped Wilcox at 1,185 ft. and was drilling below 2,000 ft.

Rains County.—American Liberty Oil 1 Republic Insurance Co., H. Howell Survey, 2 miles east of Emory, had Pecan Gap chalk at 2,200 ft., Austin chalk at 3,459 ft., and was drilling in lime, probably Georgetown, at 5,300 ft.

Smith County.—C. L. Wyckliffe 1 O. Hackett, Samuel Leeper Survey, 1½ miles north of Sand flat, was drilling below 6,400 ft. in lime.

Upshur County.—Three C's Oil 1 J. Blount, northwest part of county, was drilling below 4,128 ft. passing through sub-Clarksville formation with no shows reported. Elevation is 438 ft. and Austin chalk was lokked at 3,780 ft., top sub-Clarksville at 3,925 ft., looking for Woodbine sand.

Wood County.—Bobby Manziel 1 W. F. Bailey, Burch Survey, southeast of Coke pool, was drilling below 5,500 ft., maintaining favorable structural position compared to dry holes drilled in the area.

EAST TEXAS COMPLETIONS

Wildcats

Hunt County: Hollandsworth Drilling Co. 1 W. H. Baker, 2,360 ft. W, 660 ft. S of NW cor. Chas. Hart Sur. but in W. A. Wood Cur., elev. 512 ft., Woodbine sand 2,674 ft., dry, T.D. 2,705 ft.

Fields

Cayuga, Anderson County: Tide Water and Seaboard 4-A L. E. Harton, 467 ft. from S and W of 82.46-acre tract, Samuel Edmondson Sur., elev. 294 ft., Woodbine sand 3,787 ft., flow 67.55 bbl., pay 3,993-99 ft., perf., P.B. to 4,005 ft. from T.D. 4,061 ft.

Hawkins, Wood County: Humble 8-D B. F. Allen, 1,290 ft. E of SE cor. Brewer Sur., 816 ft. from S, 1,396 ft. from Sly. SE line, Brewer Sur., elev. 315 ft., flow 240 bbl., pay 4,719-33 ft., perf., T.D. 4,780 ft.

Humble 4-C L. A. Bryan, 467 ft. from Nly. E, 842 ft. from Nly. N lines 310.23-acre tract, M. A. Esparcia Sur., elev. 426 ft., flow 256 bbl., pay 4,912-17 ft., T.D. 4,920 ft.

Kildare, Cass County: C. C. Gilger 4 Cass County, 1,310 ft. from S, 412 ft. from W 55-acre tract, Watson Sur., elev. 261 ft., flow 132 bbl., ¼-in. choke, pay 6,053 ft., perf. 6,053-58, 6,054-58 ft., T.D. 6,200 ft.

C. H. Lyons et al 2 C. F. Smith, 467 ft. from N, 1,465 ft. from E 103-acre tract B.W. Hopson Sur., elev. 242 ft., flow 125 bbl., pay 6,032-35 ft., P.B. to 6,040 ft., from T.D. 6,065 ft.

(Reported week ended March 20)

Wildcats

Navarro County: F. B. Vonder Hoya 1 John J. Bryant, 2,200 ft. from NE, 660 ft. from SE, J. M. Morrell Sur., dry, T.D. 1,318 ft.

Fields

Hawkins, Wood County: Humble Oil 4-C Bryan Est., 467 ft. from E, 842 ft. from N, 310.23 acre tract, M. A. Esparcia Sur., elev. 426 ft., Woodbine 4,744 ft., flow 292 bbl., 26.2-gravity, T.D. 4,920 ft.

Kildare, Cass County: Texas Co. 2 Benefield & Singleton, 660 ft. from E, 1,650 ft. from N, 100 acre tract, J. Wanhope Sur., flowed 291 bbl., pay 6,022-10, 6,013-21 ft., T.D. 6,031 ft.

Quitman, Wood County: Shell Oil 2 J. B. Goldsmith, 810 ft. from N, 660 ft. from W, W. W. Lanier Sur., elev. 457 ft., cut fault at 5,540 ft., flowed 276 bbl., pay 6,206-10, 6,228-38, 6,242-84 ft., Paluxy sand, P.B. 6,313 ft. from T.D. 6,433 ft.

ILLINOIS FIELD REPORT

Franklin County Wildcat Flows Oil From Levias Lime

MATTOON, Ill.—A second pool opener within a month was indicated in Franklin County during the past week when the E. S. Adkins 1 Brown estate, SE NE NW 25-7s-2e, flowed 300 bbl. of oil in 22 hours from the Levias lime at a total depth of 2,875 ft. The well was treated with 500 gal. of acid. The 1 Brown estate is about 5 miles due south of production in the Benton field and about 2 miles due south of the West Frankfort pool, a single well pool. Both the Benton and West Frankfort pools produce only from the Tar Springs sand.

The first of the Franklin County strikes was the Seaboard 8 U. S. Coal & Coke, NE NE 26-6s-4e, about 5 miles north of Thompsonville. The 8 U. S. Coal & Coke was completed on pump during the past week for an initial gage of 275 bbl. of oil and 3 bbl. of water from the Aux Vases sand.

A St. Clair County wildcat, the Eason Oil Co. 1 Edna Thomas, NE NE NW 4-1s-8w, has been abandoned as dry at a total depth of 2,174 ft. The 1 Thomas was drilled into the St. Peter sandstone, which was topped at 2,160 ft.

ILLINOIS COMPLETIONS

Wildcats

Clay County: Stanolind 1 C. O. Riggle, W½ NW SW 24-3n-6e, dry at 3,021 ft., Kincaid 2,079 ft., Menard 2,270 ft., Tar Springs sand 2,397 ft., Glen Dean 2,476 ft., Hardinsburg 2,506 ft., Golconda 2,550 ft., Barlow 2,635 ft., Cypress sand 2,668 ft., Benoist sand 2,840 ft., Aux Vases sand 2,918 ft., Ste. Genevieve 2,976 ft., McClosky 3,010 ft.

Clinton County: Wm. Murphy 1 Becker heirs, SW NE SE 18-1n-3w, dry at 1,098 ft., Glen Dean 780 ft., Golconda 820 ft., Cypress sand 950 ft., Benoist sand 1,070 ft.

Perry A. Cotten 2 H. Bilharty, S½ NE SE 22-1n-5w, dry at 1,256 ft.

Edwards County: Nelson Dev. 1 Bunting, SE SW NW 8-2s-10e, dry at 3,447 ft.

Effingham County: Walter Duncan 1 Bunk, SE SW SW 34-6n-7e, pumped 21 bbl., Weiler 2,534 ft., T.D. 2,539 ft., pool opener.

Franklin County: Seaboard 8 U. S. Coal & Coke, NE NE 26-6s-4e, pumped 274 bbl., shot 3,122-29 ft., Aux Vases sand 3,122-28 ft., T.D. 3,132 ft., pool opener.

Hamilton County: Gulf Ref. 1 Claude Harrawood, NW NE NW 10-6s-7e, dry at 3,085 ft., Glen Dean 2,509 ft., Cypress 2,780 ft., Aux Vases 3,076 ft.

Jefferson County: C. Frazier 1 B. Buckley, N½ SW SE 27-3s-4e, dry at 3,199 ft., Glen Dean 2,520 ft., Hardinsburg sand 2,568 ft., Golconda 2,619 ft., Benoist sand 2,972 ft., Ste. Genevieve 3,081 ft., McClosky 3,157 ft.

Marion County: Seaboard 1 Kniseley, NE SE SE 18-3n-4e, dry at 2,626 ft., Menard 1,810 ft., Tar Springs sand 1,937 ft., Glen Dean 2,040 ft., Benoist sand 2,362 ft., Aux Vases sand 2,450 ft., Ste. Genevieve 2,487 ft., Levias 2,523 ft., McClosky 2,569 ft.

Perry County: Texas 1 J. Matlavish, NW SW NE 36-4s-2w, dry at 4,121 ft., Devonian 2,870 ft., Trenton 3,984 ft., Decorah 4,094 ft., Platin 4,098 ft.

Wabash County: Sinclair 2 M. Strasser, SW SW NW 3-2s-13w, dry at 2,772 ft., Waltersburg 1,939 ft., Tar Springs sand 2,045 ft., Glen Dean 2,129 ft., Golconda 2,231 ft., Ste. Genevieve 2,600 ft., McClosky 2,676 ft.

Wayne County: N. V. Duncan 1 J. M. Beek Consol., SE NE 5-1s-7e, dry at 3,330 ft., Glen Dean 2,651 ft., Golconda 2,740 ft., Cypress sand 2,847 ft., Weiler 2,905 ft., Benoist sand 3,100 ft., Aux Vases sand 3,143 ft., Ste. Genevieve 3,175 ft., McClosky 3,232 ft.

Pure 1-B W. R. Atteberry, NE SE NW 1-1s-7e, dry at 3,320 ft., Weiler 2,895 ft., Benoist sand 3,035 ft., Aux Vases sand 3,077 ft., Ste. Genevieve 3,128 ft., McClosky 3,208 ft.

Fields

Boulder, Clinton County: Texas 3 B. Ward, NE NE 2-2n-2w, flowed 164 bbl., 32 per cent b.s. and w., Devonian 2,576 ft., pay 2,660-71 ft., T.D. 2,671 ft.

Dale, Hamilton County: Texas 1 M. Sierks, SE SE SW 18-6s-7e, pumped 98 bbl., shot 3,069-90 ft., Aux Vases sand 3,053 ft., T.D. 3,090 ft.

Dundas, Jasper County: Standard Drlg. 2 Poehler, E½ NW NW 7-5n-10e, dry at 2,897 ft., Glen Dean 2,368 ft., Ste. Genevieve 2,811 ft.

Flora, Clay County: Tide Water 1 Theo Winka, SW SW 13-3n-6e, pumped 148 bbl., acidized, McClosky 2,971-86 ft., T.D. 2,990 ft.

Friendsville, Wabash County: Skiles et al 1 Murray Burkett, SE SE SE 34-1n-13w, pumped 70 bbl. oil and 15 bbl. water, Palestine 1,781 ft., T.D. 1,805 ft.

Iola, Clay County: Tide Water 5 Davis, NE SE NE 15-5n-5e, pumped 200 bbl. oil and 20 bbl. water, Cypress sand 2,124-38 ft., Benoist sand 2,284-2,300 ft., Aux Vases sand 2,337 ft., T.D. 2,353 ft.,

Tide Water 4 Davis, NW SE NE 15-5n-5e, pumped 120 bbl., Cypress sand 2,124-39 ft., Benoist sand 2,282-2,306 ft., Aux Vases sand 2,337 ft., T.D. 2,338 ft.

Texas 7 A. Kidwell, NW SE NW 15-5n-5e, pumped 93 bbl., Benoist sand 2,268-88 ft., Aux Vases sand 2,324-33 ft., T.D. 2,342 ft.

Shell 1 Leonard, NE NE SW 15-5n-5e, pumped 94 bbl. oil and 3 bbl. water, Aux Vases sand 2,310-36 ft., T.D. 2,372 ft.

Luttrell 2-A Reid heirs, SW NW NE 15-5n-5e, pumped 185 bbl., Aux Vases sand 2,323-56 ft., T.D. 2,380 ft.

Central P. L. 2 Reid, SW NW NW 14-5n-5e, pumped 106 bbl., Cypress sand 2,132 ft., T.D. 2,146 ft.

Louden, Fayette County: Carter 28-4 M. Durbe, SW NE NE 28-6n13e, gas input well, Benoist sand 1,507-24 ft., T.D. 1,535 ft., P.B. 1,512 ft.

Markham City, Jefferson County: Gulf Refg. 1 L. E. Dunning, NE SE NW 36-2s-4e, pumped 356 bbl., acidized, McClosky 3,021-30 ft., T.D. 3,040 ft.

Gulf Refg. 1 W. E. Osborne, NE NW 36-2s-4e, dry at 3,120 ft., Glen Dean 2,464 ft., Ste. Genevieve 3,024 ft., McClosky 3,093 ft.

New Harmony, White County: Superior 3 Speck, NW NW SW 31-4s-14w, pumped 60 bbl., shot 2,028-38 ft., Tar Springs sand 2,280-85 ft., 2,350-55 ft., T.D. 2,360 ft.

Noble, Richland County: Pure 36 Coen, S½ S½ SE 4-3n-9e, pumped 159 bbl. oil and 479 bbl. water, Weiler 2,592-2,618 ft., T.D. 2,650 ft.

North Sims, Wayne County: Pure 2 E. Talbert, NE NW NE 17-1s-6e, pumped 350 bbl., natural, Aux Vases sand 3,013 ft., saturation 3,015-35 ft., T.D. 3,040 ft.

Pure 1-A J. E. Barnard, NE NW NW 17-1s-6e, pumped 211 bbl., natural, Aux Vases sand 3,009 ft., pay 3,013-36 ft., T.D. 3,040 ft.

Pure 1 T. W. Lowe, SW NW SW 8-1s-6e, pumped 17 bbl. oil and 61 bbl. water, shot 3,043-56 ft., Aux Vases sand 3,043-59 ft., T.D. 3,060 ft.

Phillipstown, White County: Sun Oil 13 H. J. Garner, NW SE NW 6-5s-11e, pumped 316 bbl., Tar Springs sand 2,300 ft., T.D. 2,330 ft.

Rural Hill, Hamilton County: Texas 3 L. W. Smith, NW SW NE 24-6s-5e, pumped 88 bbl., shot 3,127-50 ft., Aux Vases sand 3,107-46 ft., T.D. 3,153 ft.

South Lawrence, Lawrence County: Smith & Nye 5 C. Catt, S½ E½ SW 23-2n-12w, pumped 175 bbl. oil and 15 bbl. water, Biehl 1,299-1,336 ft., 1,355-1,400 ft., T.D. 1,400 ft.

South Mason, Effingham County: K. Benson et al 1 R. Wright, SW NW SE 27-6n-5e, dry at 2,393 ft., Glen Dean 1,996 ft., Golconda 2,060 ft., Benoist sand 2,305 ft., Aux Vases sand 2,368 ft.

Woodlawn, Jefferson County: Ruwaldt et al 3 R. Rynski, NE NW NW 35-2s-1e, pumped 130 bbl., shot 1,984-94 ft., Benoist sand 1,986 ft., T.D. 1,997 ft.

(Reported week ended March 20)

Fields

Belle Rive, Jefferson County: Nash Redwine 5 M. Randolph, SW SE NW 34-3s-3e, pumped 143 bbl. oil and 4 bbl. water, shot 2,719-29 ft., Aux Vases sand 2,724-38 ft., T.D. 2,739 ft.

Texas 2 H. Smith, NE NE NE 33-3s-3e, pumped 140 bbl., shot 2,738-58 ft., Aux Vases sand 2,721 ft., 2,737-48 ft., T.D. 2,762 ft.

Clay City, Wayne County: Pure 1-D Hosselton, W½ NE SE 21-2n-8e, pumped 136 bbl., acidized, McClosky 3,003-06 ft., 3,013-17 ft., 3,042-44 ft., 3,049-51 ft., 3,052-62 ft., T.D. 3,065 ft.

Pure 2-A Riggs, NE SW SE 2-1n-7e, pumped 10 bbl., acidized, McClosky 3,042-55 ft., T.D. 3,055 ft.

Cordes, Washington County: Magnolia 10 Gill estate, SW NW NW 26-3s-3w, pumped 57 bbl. oil and 69 bbl. water, shot 1,279-89 ft., Benoist sand 1,265-80 ft., T.D. 1,289 ft.

Dale, Hamilton County: Menhall et al 1 R. Harrawood, SE NE NW 19-6s-7e, pumped 134 bbl. oil and 45 bbl. water, shot 2,760-96 ft., Weiler 2,751 ft., T.D. 2,800 ft.

Louden, Fayette County: Carter 4 A. Alsop, SW SE SW 3-8n-3e, swabbed 96 bbl., Weiler 1,523-35 ft., T.D. 1,535 ft.

New Harmony, White County: Superior 24 H. C. Ford et al, NE SW SW 4-5s-14w, pumped 51 bbl., shot 2,185-2,200 ft., Waltersburg sand 2,169-93 ft., T.D. 2,200 ft.

North Aden, Wayne County: Gulf Refg. 1 J. V. Heidinger, SW SW 29-1s-7e, dry at 3,063 ft., junked hole, Glen Dean 2,667 ft.

Phillipstown, White County: Jarvis & Marcell 3 Garner, NE SE NE 31-4s-11e, pumped 125 bbl., Tar Springs 2,270 ft., T.D. 2,342 ft.

Jarvis & Marcell 2 C. T. Spencer, SE SE SW 31-4s-11e, pumped 375 bbl., Tar Springs sand 2,324-53 ft., pay 2,324-53 ft., T.D. 2,353 ft.

South Johnsonville, Wayne County: Olson

(Continued on Page 81)

For Your Guidance

IN THE SELECTION OF PRESSURE REGULATORS, DIAPHRAGM CONTROL VALVES, FIELD AND SERVICE REGULATORS, BOILER GAS FUEL GOVERNORS, MISCELLANEOUS CONTROL EQUIPMENT.

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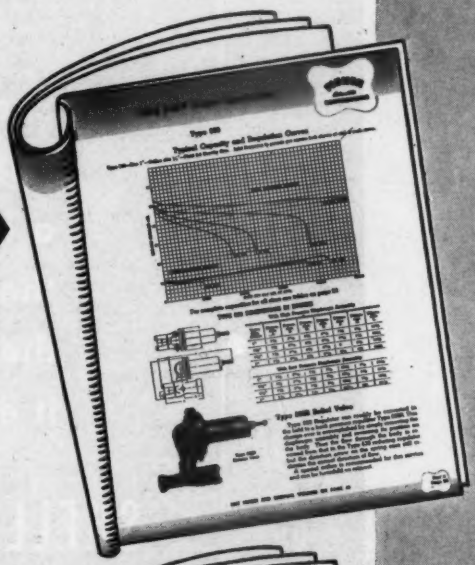

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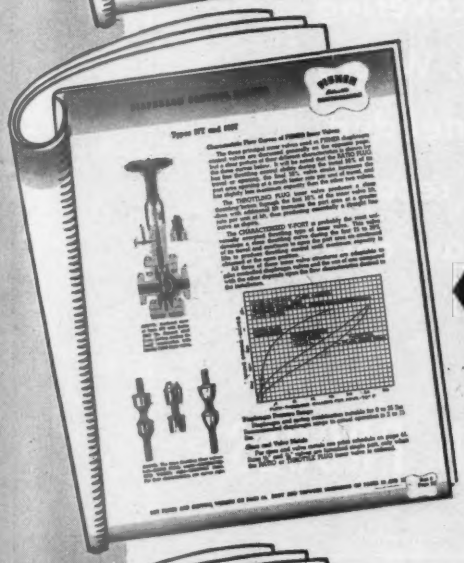

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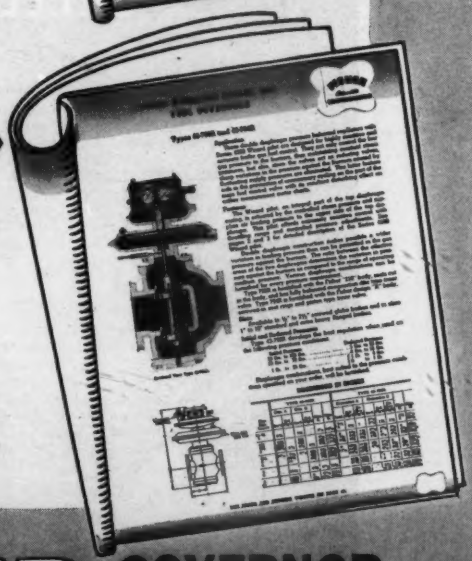

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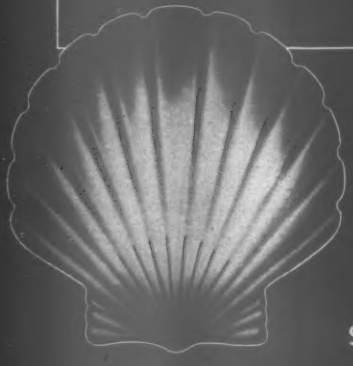

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SHELL DEVELOPMENT COMPANY

N. CENTRAL TEXAS

Production Opened From Caddo Lime in Mueller Field

WICHITA FALLS, Tex.—Continental Oil Co. 1 W. A. Richardson, F. Hamilton Survey, west offset to the discovery well in the Mueller pool which produces from the Simpson sand, gaged 368 bbl. oil and 34 bbl. water on 40/64-in. choke from Caddo lime topped at 6,015 ft. to open a new pay for the area, Seven-inch casing, set at 6,070 ft., was perforated from 6,015-22 ft. with 21 shots, after salt water showed through previous perforations from 6,033-45 ft. The discovery well flowed 440 bbl. from total depth 7,259 ft. late in November 1942.

Archer County.—New deep wildcat operation is Phillips Petroleum 1 L. F. Wilson, 5,200-ft. rotary test 5 miles north of Archer City, located NW NW NE Section 117, A.T.N.C.L. subdvision. Moran & Moran 1 Jentsch, 1 mile northwest of the Browning pool, swabbed 20 bbl. oil in 20 hours from Ellenburger lime 5,204-57 ft., total depth, after treatment with 5,000 gal. acid. Tom D. Medders 1 Vogtsberger, mile outpost to Vogtsberger pool, was running electrical survey to total depth 4,776 ft. to determine porosity in Strawn sands showing oil drilled from 4,698 ft. to total depth. Same operator's 1 Mrs. O. M. Fuller, Section 12, Block 1, H.&T.C. Survey, southwest outpost to the Vogtsberger pool, was shut down at 4,971 ft., after coring oil sand from 4,755-60 ft.

Young County.—Prospects for production at Anderson-Prichard and Darby Petroleum 1 Henry Mooney, Mooney Survey, just north of the Stephens County line, were favorable as oil and drilling mud were being swabbed from the hole, after acid treatment of 7,000 gal. in the Caddo lime section perforated from 3,500-55 ft. With elevation of 1,160 ft., the test had been drilled into the Ellenburger, topped at 4,696 ft., to 4,809 ft., and was plugged back to test shows passed up. Fleming Oil 2 M. K. Graham, Section 2912, T.E.&L. Survey. 10 miles southwest of Newcastle, drilled lime showing oil in Caddo section from 3,801-08 ft. and shut down to set casing. L. A. Long 1 Donnell, Eliasville area, was shut down for orders at 3,688 ft. in shale. Tolbert Drilling Co. and Continental Oil 1 Graham, Section 2398, T.E.&L. Survey, 2 miles north of Murray, was drilling at 1,685 ft.

NORTH TEXAS COMPLETIONS

Fields

Bowers, Montague County: Pace Petroleum 1 J. M. Slayton est., 330 ft. from S, 1,113 ft. from W, Jas. Ferguson Sur., granite 3,907 ft., dry, T.D. 3,922 ft.

Bunger, Young County: Cosden Petroleum 1 R. D. Owen, 467 ft. from N and E S½ J. E. Dowdle Sur. A-2250, elev. 1,127 ft., flow 17 bbl., pay 3,990-4,001 ft., lime, T.D. 4,045 ft.

Cooper, Archer County: Geo. W. Cooper 1 Perkins & Cullum, 660 ft. from N and E Blk. 69, K.W.F.V.L. Sur., flow 288 bbl., pay 4,899 ft., lime, T.D. 4,918 ft.

Harrison & Allen, Clay County: Fortex Oil 1-A Harrison & Allen, 990 ft. from SE 990 ft. from SW Sec. 35, Jane Duncan Sur., SSO 224-31 ft., dry, T.D. 266 ft.

Fortex Oil 5 Harrison & Allen, 160-acre tract, Jane Duncan Sur. A-112, dry, T.D. 1,361 ft.

K.M.A., Wichita County: Grace & Grace 2 J. E. Roller est., 575 ft. from E, 710 ft. from S, Lot 74, Roller Sub., R. J. Scott Sur, A-256, flow 902 bbl., pay 4,033-97 ft., T.D. 4,108 ft.

Ryan Consolidated Oil 132 G. L. Nance, 330 ft. from S, 375 ft. from W, S. O. Fowler Sur. A-78, elev. 1,013 ft., pump 22 bbl., pay 3,768-3,852 ft., shot 130 qt., T.D. 3,888 ft.

Knox-Mississippi, Young County: Mudge Oil 8 Mrs. W. B. Harrison, 660 ft. from N, 1,885 ft. from E, Felipe Jaime Sur. A-157, flow 1,666 bbl., pay 4,728 ft., Mississippi lime, acid 1,000 gal., T.D. 4,765 ft.

Hoefle, Jack County: Standard of Texas and Hanlon-Buchanan 1 J. B. Jackson, lease of S.P.R.R. Sur. A-578, elev. 1,101 ft., flow 525 bbl., 1 per cent water, pay 4,820 ft. lime, acid 3,000 gal., T.D. 4,830 ft.

Standard of Texas and Hanlon-Buchanan 1 J. Moore, 467 ft. from N, 2,333 ft. from W, J. B. Jackson Sur., elev. 1,130 ft., flow 361 bbl., pay 4,800 ft., Caddo lime, acid 3,000 gal., T.D. 4,830 ft.

Ringold, Montague County: Old well worked over: Gulf Oil 1 C. W. Scaling, Sec. 3, T.&N.O. Ry. Sur., old T.D. 5,439 ft., P.B. 3,400 ft., acid 500 gal., pay 3,360-3,400 ft., lime, pump 25 bbl., 95 per cent water.

Ross, Clay County: Continental Oil 11 O. O. Ross, Jr., 1,501 ft. from E, 1,336 ft. from S, 600-acre tract Wm. Walker Sur., elev. 918 ft., pump 77 bbl., 42 grav., pay 5,404 ft., lime, perf. 5,408-60 ft., T.D. 5,527 ft.

Thornberry, Clay County: Kimbell & Bohner 2 Dolph Summers, 330 ft. from NW, 990 ft. from NE 102-acre tract, Wiley Wyatt Sur., Sub. 2, dry, T.D. 1,410 ft.

(Reported week ended March 20)

Fields

Brockman, Throckmorton County: Trumter Pet. 1 L. G. Brockman, 330 ft. from N and W lines, Blk. 75, Comanche Indian Reserve, elev. 1,332 ft., dry, T.D. 745 ft.

Davenport, Montague County: Lesh & McCall 1 W. A. Reed, T. J. Robinson Sur., pump 80 bbl., perf. 45 shots 2,414-35 ft., P.B. 2,600 ft. from T.D. 2,850 ft., granite

Electra, Wichita County: Paradise Oil 1-E W. T. Waggoner Est., Sec. 1, G.C.&S.F. Sur., A-531, I.P. 35 bbl., pay 1,942 ft., T.D. 1,967 ft.

Electra, Wilbarger County: F. Wood 1 W. T. Waggoner Est., Sec. 30, Blk. 5, H.&T.C. Sur., dry, T.D. 2,015 ft.

Ferguson, Young County: A. G. Talbot et al 2 Pauline Ferguson, 330 ft. from N, 495 ft. from E, L. W. Smith Sur., A-1822, pump 60 bbl., pay 3,481 ft., T.D. 3,512 ft.

Harrold, Wilbarger County: C. H. Kadane et al 2 R. L. Cochran, 350 ft. from S, 358 ft. from W of N 46½ acres, Sec 2, M.K&T. Sur., elev. 1,200 ft., I.P. 240 bbl., pay 3,291-93 ft., perf. 3,257-73 ft., T.D. 3,293 ft.

K.M.A. Ellenburger, Wichita County: E. C. Oil 8-E Geo. LeBus, 400 ft. from N, 499.7 ft. from W of S 100 acres of W. H. Spillers Sur., A-258, flow 964 bbl., pay 4,250-80 ft., Ellenburger, T.D. 4,280 ft.

Knox-Mississippi, Young County: Rankin & Elliott 1 Mrs. E. Taylor, Sec. 1975, T.E.&L. Sur., dry, T.D. 4,853 ft.

Lupton & McLester, Young County: Belfort Oil 1 J. T. Robertson, 660 ft. from NW, 990 ft. from NE, Sarah McKissick Sur., A-184, I.P. 30 bbl. pay 3,840 ft. sand, T.D. 845 ft.

Swastika, Archer County: Guy Scholl 1 C. W. Clark, 660 ft. from N and W lines 60 acre lease Blk. 13, South Anderson Pasture Subd., C. P. Diggs Sur., pump 10 bbl., pay 1,359 ft., T.D. 1,367 ft.

Wichita County, Misc.: E. W. Whitaker 1 Hoge, 990 ft. from NWC, 330 ft. from N, 74 acre tract, Blk. 38, W.V.F.L. Sub., I.P. 5 bbl., pay 1,759 ft., T.D. 1,765 ft.

WEST CENTRAL TEXAS

ABILENE, Tex.—E. Constantin and associates 1 Sealy-Smith, Section 71, Block 2, G.H.&H. Survey, Coleman County, on the east edge of Coker pool, was estimated at 250 bbl. per day from Morris sand from 3,004-29 ft. The Silver Valley pool, east of Novice, was favored with two new operations by States Oil Corp., both to go to 3,600 ft.

Jones County.—New try for a link between the Wimberly and Akard pools was announced last week by F. R. Sylvester, who staked location for 1 C. S. Mahan, 467 ft. from north and west lines of 180-acre tract in G. Martinez Survey 137. The test is to go to 2,300 ft.

Shackelford County.—Shallow wildcat to test the Bluff Creek sand was located 4 miles northeast of Lueders, to be drilled by Fain & McGaha on the A. A. Gustafson farm, SW SW NW Section 169, B.B.B.&C. Survey.

Taylor County.—The Reddin pool was given a good well from the lower Hope lime at Butler & Horne et al 4 C. H. Hudson which flowed 55 bbl. per hour to rate a daily potential of 1,320 bbl. Pay is from 2,399-2,410 ft.

WEST CENTRAL TEXAS COMPLETIONS

Wildcats

Palo Pinto County: Fred Guyer 1 R. S. Dalton, 80-acre lease, L. B. Dayton Sur., dry, T.D. 4,195 ft.

Fields

South Noodle, Jones County: Humble Oil & Refining 1 J. M. Williamson, NW SW Sec. 31, Blk. 18, T.&P. Ry. Sur., elev. 1,896 ft., dry, T.D. 3,135 ft., sand.

Strand, Jones County: S. B. Roberts and Fain & McGaha 1-B Hazel Strand, SE NW Sec. 5, Blk. 5, H.&T.C. Ry. Sur., Palo Pinto 3,420 ft., dry, T.D. 3,424 ft.

Wimberly, Jones County: Maracaibo Oil Exploration 1 C. F. McCoy, 330 ft. from S, 700 ft. from E, Blk. 67, Lge. 125, DeWitt County School Land, elev. 1,752 ft., flow 200 bbl., pay 2,392 ft., T.D. 2,398 ft.

Reddin, Taylor County: Butler & Horne et al 4 C. H. Hudson, 330 ft. from N.

(Continued on Page 73)

APPALACHIAN FIELDS

Southwest Pennsylvania Tests Drilling in Devonian

PITTSBURGH, Pa.—The deep tests in Southwest Pennsylvania and Maryland are all at a critical stage and drilling in the bottom of the Devonian and should reach identifying markers shortly. A late report places the Tully lime in Peoples Natural Gas Co. 1 Walters on Chestnut Ridge in South Union Township, Fayette County, at 6,921 ft., where it will be cased on account of the extreme difficulty of keeping the hole straight. Unless faulted, the Onondaga should be reached in the next 500 ft. which places it within production possibilities. Except for a fair Injun sand gas well in Clay County, West Virginia developments were unimportant.

SOUTHWEST PENNSYLVANIA

On Chestnut Ridge in Derry Township, Westmoreland County, Peoples Natural Gas Co. has started drilling the deep test on the Camilla Giffin farm which is scheduled for the Oriskany sand. It is drilling at 270 ft. On Laurel Ridge in Ligonier Township, New Penn Development Co., William E. Snee et al are running casing in the test on the John and Eleanor Beck farm and have 5,900 ft. in the hole. The depth of this test is 7,276 ft., which is believed but a couple of hundred feet above the Onondaga if the test is fortunate enough to keep on the present side of the fault.

Maryland wildcat.—William E. Snee et al are drilling through broken lime which was dumped in the hole in the No. 1 Speicher on the Accident dome in Garret County, in an attempt to straighten the hole which was diverging from the vertical. The present depth is 7,120 ft. after reaching 7,154 ft. Great difficulty is found in the deep tests on very pronounced structures due to folding and faulting which tends to keep the tools off vertical. More survey work of the holes now drilling is being done than ever before and it has proven valuable.

SOUTHWEST PENNSYLVANIA COMPLETIONS

Armstrong County, Boggs Township: S. J. Galbraith 1 Walter Ellenburger, 30,000 cu. ft. gas, Murraysville and Hundred-foot sands, T.D. 1,545 ft.

Wayne Township: R. C. Galbraith 1 Mrs. G. W. Walls, 100,000 cu. ft. gas, Murraysville and Hundred-foot sands, T.D. 1,425 ft.

Greene County, Gilmore Township: J. W. Moorhead et al 1 Lee Garrison, 267,000 cu. ft. gas, Fourth sand 2,956 ft., gas 2,976 ft., T.D. 2,997 ft.

Washington County, West Bethlehem Township Gas Co. 1 Lewis Amos, 231,000 cu. ft. gas, gas sand 1,267-1,341 ft., gas and water 1,304-07 ft., Salt sand, 1,435 ft., gas 1,477-80 ft., T.D. 1,480 ft.

(Reported week ended March 20)

Armstrong County, Bethel Township: Local Co. (C. L. Sipe, contractor) 1 Henry Pfeffer, 1,042,000 cu. ft. gas, Thirty-foot sand 1,770 ft., gas 1,772 ft., R.P. 625 lb. 12 hr.; T.D. 1,772 ft.

Kiskiminitas Township: Peoples Natural Gas Co. 1 Samuel Baker, drilled deeper, 10,500 cu. ft. gas, Bradford sand, T.D. 3,152 ft.

Chestnut Ridge Oil & Gas Co. 1 Park Rupert after shot 208,800 cu. ft. gas; gas 3,463 ft., T.D. 3,580 ft.

Greene County, Washington Township: Carnegie Natural Gas Co. 1 Mary H. Hawkins, 3,000,000 cu. ft. gas, Fifty Foot sand, T.D. 2,710 ft.

Washington County, North Bethlehem Township: George K. Gray & Son 1 Samuel Weir, dry, T.D. 1,398 ft.

Nottingham Township: A. L. Phillips et al 1 F. B. Hamilton, 1,000,000 cu ft. gas; Big Injun 1,502 ft., gas 1,570-75 ft., T.D. 1,575 ft.

Westmoreland County, Bell Township: Peoples Natural Gas Co. 2 H. C. Hicks Coal Co., 440,000 cu. ft. gas, sand 1,300-67 ft., gas 1,360 ft., sand 1,374 ft., gas 1,376-80 ft., T.D. 1,388 ft.

WEST VIRGINIA

Jackson County.—In the Oriskany field the test of United Fuel Gas Co. on the W. W. Shinn farm in Ripley district has resumed drilling through the sand. In this test some gas was struck in the upper part of the sand and also some oil, in fact an appreciable amount. The surface elevation is 983 ft., Big lime 2,054 ft., Corniferous lime 5,206 ft., Oriskany 5,309 ft., and it is now drilling at 5,338 ft. and carrying 2,600 ft. of oil in the hole. The gas volume is 267,000 cu. ft.

WEST VIRGINIA COMPLETIONS

Calhoun County, Sherman district (report delayed): White Pine Oil & Gas Co. 1 W. H. Ayers, 3 bbl., Injun sand, T.D. 1,927 ft.

Clay County, Buffalo district: Pittsburgh & West Virginia Gas Co. 7910 Elk River Coal & Land Co., 1,960,000 cu. ft. gas, Big Injun, T.D. 1,582 ft.

Henry district: Virginian Gasoline & Oil Corp. V1300 J. B. Casto et al, 12 bbl. and a small amount of gas, Big Injun sand, T.D. 2,029 ft.

Gilmer County, Center district: Carnegie Natural Gas Co. 1579 W. B. Jackson et al, 267,000 cu. ft. gas, Big Injun 1,755-1,837 ft., gas 1,900-06 ft., gas 1,815-35 ft., R.P. 625 lb. 24 hr., T.D. 1,856 ft.

Taylor County, Flemington district: Pittsburgh & West Virginia Gas Co. 6122 John F. Taylor, 445,000 cu. ft. gas, Fifty-foot sand 1,744 ft., gas 1,749-52 ft., gas 1,760-64 ft., T.D. 1,771 ft.

Wayne County, Lincoln district: Southeastern Gas Co. 3 Sarah E. Fuller, 84,000 cu. ft. gas after shot, brown shale, T.D. 2,675 ft.

Wetzel County, Grant district: South Penn Natural Gas Co. 4 L. S. Walters, 2 bbl. and 27,000 cu. ft. gas, Little Dunkard 1,071-1,120 ft., oil and gas 1,104-16 ft., shot 1,104-16 ft., T.D. 1,160 ft.

(Reported week ended March 20)

Boone County, Scott district: Owens, Libby-Owens Gas Department 651 Francis Pauley, 133,000 cu. ft. gas, Big Lime 1,354 ft., Injun 1,549 ft., Berea 2,057 ft., T.D. 2,115 ft.

Clay County, Pleasant district: Elk River Gas Co. 1 Stephenson heirs, dry, Big lime 2,015 ft., in Injun sand present, T.D. 2,240 ft.

Gilmer County, Center district: Pittsburgh & West Virginia Co. 7,528 J. L. Upton, dry through Big Injun sand, T.D. 2,-061 ft.

Kanawha County, Big Sandy district: Falling Rock Producing Co. 112 fee, 325,000 cu. ft. gas, Berea sand, T.D. 2,034 ft.

Wayne County, Stonewall district: Owens, Libby-Owens Gas Department 653 Hoard-Baldwin, 103,000 cu. ft. gas, Big lime 1,344 ft., Injun 1,571 ft., T.D. 1,605 ft.

Wirt County, Burning Springs district: W. C. Patterson 6 D. A. Riley, dry, Big lime 1,139 ft., Big Injun 1,303 ft., T.D. 1,355 ft.

ORISKANY GAS FIELDS

Jackson County, Ravenswood district: Columbian Carbon Co. 690 J. A. Harpold, 3,253,000 cu. ft. gas, elev. 729 ft., Big lime 1,907 ft., Berea 2,540 ft., Corniferous lime 4,980 ft., Oriskany 5,093 ft., T.D. 5,170 ft.

(Reported week ended March 20)

Kanawha County, Poca district: Columbian Carbon Co. 688 C. J. Holmes, 1,929,000 cu. ft. gas, elevation 763 ft., Oriskany 4,850 ft., shot 4,850-90 ft., T.D. 4,925 ft.

MICHIGAN

New Field Discovered In Van Buren County

SAGINAW, Mich.—Field operations in the past week resulted in 11 completions, with 7 dry holes. In Fork Township, Mecosta County, Gulf Refining Co. drilled a well producing 378 bbl. a day, naturally, and a 136-bbl. wildcat well was developed in Bangor Township, Van Buren County. The dry holes included a Pure Oil Co. deep test in Franklin Township, Clare County. The test was abandoned at 5,929 ft.

New drilling permits for the year increased to 81 with 5 more issued last week by the state Conservation Department. Two of the locations are in Bay County, others in Allegan, Clare and Ottawa counties.

MICHIGAN COMPLETIONS

Allegan County, Dorr Township: Dapar Oil Co. 1 Stebbins, NW NE NE 3-4n-12w, wildcat test, dry, T.D. 1,748 ft.

Monterey Township: Stanley L. Findlay 1 McNab, NW NE SE 9-3n-13w, dry hole, T.D. 1,779 ft.

Salem Township: James S. Brailey 1 Shields estate, NE NE SE 26-4n-13w, wildcat test, dry, T.D. 1,783 ft.

Clare County, Franklin Township: Pure Oil Co. 1 Thompson, C N½ NW SE 3-20n-3w, dry hole, T.D. 5,929 ft.

Gladwin County, Billings Township: Goll, Graves & Mechlin et al 1 Smith et al, C SE 9-17n-1e, pumping 25 bbl., acidized, T.D. 3,611 ft.

Mecosta County, Fork Township: Gulf Refining Co. 1 Hamill, C S½ NE NW 8-16n-7w, flowing 378 bbl. naturally, T.D. 3,798 ft.

Osceola County, Leroy Township: R. W. Power and M. E. Worlsey wildcat test, C S½ SW SE 31-19n-10w, dry hole, T.D. 3,684 ft.

Ottawa County, Holland Township: Robert L. Sanders 1 Boscht & Walters communitized, C NE SW 36-5n-15w, wildcat test, flowing 136 bbl., acidized, T.D. 1,516 ft.

Zeeland Township: C. A. Perry-Cross & Gould 1 Veurink, SE NW SE 31-5n-14w, dry hole, T.D. 1,517 ft.

Van Buren County, Bangor Township: Fisher-McCall Oil & Gas Co., Inc., 1 Salnave-Botka & McKee, SW SW NW 9-2s-16w, 10 bbl. naturally, with salt water, T.D. 1,016 ft.

Geneva Township: Hugh H. Heinig 1 Krause & Majewski, C SE SW 29-1s-16w, wildcat test, dry, T.D. 1,036 ft.

ROCKY MOUNTAIN AREA

Deep Lakota Sand Test to Be Drilled in Cole Creek Field

DENVER, Colo.—General Petroleum Corp. is building rig for 48 State, SE SE SW 16-35n-77w, Cole Creek field, Wyoming, which will go to the Lakota sand at around 8,000 ft. This is the first of two wells to be drilled to that horizon this year. It is located ½ mile north of the discovery well which was completed in 1939 for 245 bbl. initial on the pump from the Lakota-Dakota sands at 7,910-8,015 ft. Afterwards the well went to water and was plugged back and recompleted in the Shannon sand. Subsequent to the completion of the discovery well about 18 wells were drilled to the Shannon sand at around 4,500 ft., a definite marker, which facilitated the working out of the structure on the Dakota sands. The deep test now getting under way was spotted on the basis of the new geology.

The Montana Department of State Lands is conducting a number of sales of oil and gas leases on state lands as a result of the present wildcat play in that state. Early in March, 16 tracts were offered of which Carter Oil Co. was high bidder on 13 tracts, some in the Cut Bank area and others in the northeast corner of Yellowstone County. Another offer of 26,000 acres in 72 tracts was made on March 23, but bids have not been reported pending approval by the board. A third sale covering 18,000 acres will take place later in the month. The board, as of February 27, made a ruling to accept only cash bids. This did away with a proposal for higher royalties to the state in lieu of cash bonuses. Applications for leases have to be accompanied with a minimum remittance of 75 cents an acre for the first year's rentals, plus a fee of $2.50. The land is then advertised and offered for lease through oral competitive bids.

Cut Bank.—The Blackfeet Indian tribe, which owns extensive land holdings in the Cut Bank area, is trying out a new system for leasing its lands. Contracts are arranged at private sales in which the operator agrees to pay 17½ per cent royalty instead of the former 12½ per cent and 35 per cent of net profit after allowing deductions for cost of operating wells and also for cost of any dry holes drilled on the lease. A dozen or more such contracts have been made, including four recently granted to William M. Hanlon on the west side of the Tribal pool at the south end of the field. These call for 12 wells, 10-year leases and 17½ per cent royalty.

Fremont County, Wyoming.—Several important wildcats to be drilled to deeper horizons in the west central part of Wyoming are scheduled for this summer. F. F. Hintze has made a location for 2 Government, SW NW NW 7-28n-92w, on Spring Creek, Fremont County, which will go to the Tensleep at around 4,500 ft. It offsets a hole drilled to 1,195 ft. which had shows of oil and gas in the Frontier. Another deep test is scheduled for the South Baxter Basin field, in Sweetwater County, by the Mountain Fuel Supply Co., which will go to the Tensleep at around 7,000 ft. Rig is being moved in, but location has not yet been released. South Baxter produces from the Frontier and Dakota series, the latter running around 3,500 ft. Another deep test to the Tensleep is reported planned by the Sinclair-Wyoming Oil Co. in Big Sand Draw, Fremont County, to go around 6,900 ft. The deepest horizon tested in this field is the Morrison at 4,500 ft.

Northeast Arizona.—The Argo Oil Co. and the Midwest Oil Co. have made applications for leases on 27,634 acres of state land in Apache County. One block is on the Zuni River structure, which lies close to the Utah line and due west from the producing fields in Northwest New Mexico. The other is on the Salt Mont structure, southeast of St. Johns. The two companies also have large blocks of fee and other lands in the two areas and have posted a $100,000 bond to insure the starting of drilling on one of the structures within 6 months after leases are granted. The two companies have had extensive geological work under way in that area for a number of years and in 1937 had 35,000 acres under lease on one of these domes. They drilled in 1939 on the Apache dome in the county of that name.

Elk Basin.—Ohio Oil Co. 4 Mack-OPC-4, Elk Basin field, made 30 bbl. an hour from the Tensleep at 4,542 ft., total depth, with 5½-in. at 4,472 ft. Sand record was not released, but the production is supposed to be coming from a second bench in the Tensleep, not drilled in the Minnelusa discovery well.

MONTANA COMPLETIONS

Cedar Creek, Fallon County: Montana-Dakota Utilities No. 168, SW 29-9n-59e, T.D. 1,150 ft., 1,400,000 cu. ft. from Judith River formation at 1,060-1,150 ft.

Montana-Dakota Utilities No. 172, NE NE 8-8n-59e, T.D. 986 ft., 175,000 cu. ft. from Judith River at 920-969 ft.

Montana-Dakota Utilities No. 170, NE 22-8n-59e, T.D. 930 ft., 150,000 cu. ft. from Judith River.

Kevin-Sunburst, Toole County: O. Nepstad 4 Haugen, NW NE 11-35n-3w, dry in contact, break at 1,850-57 ft., acid, pumping 11 bbl. per hour, very little water.

Texas Co. 7 Lind NE NE NE 11-35n-2w, T.D. 1,661 ft., contact 1,647 ft., acid, pumped 102 bbl.

(Reported week ended March 20)

Clark's Fork, Carbon County: Northern Ordnance, Inc. 1 Government C NW NW 25-9s-22e Dry at 4,212 ft., sand at 3,750-3,850 ft., tentatively identified as Parkman.

Cut Bank, Glacier County: Glacier Prod. Co. 8 Lookhoff C SW NE 33-33n-5w. T. D. 2,948 ft., 7-in. 2,925 ft., P. B. to 2,944 ft., Cut Bank 2,903-44 ft., main pay 2,938-55 ft., swabbed 47 bbl.

Kevin-Sunburst, Toole County: Twinfields Oil Co. 4 Thompson NE NE SW 28-35n-3w. T. D. 1,858 ft., contact 1,668-71 ft., show oil, water in break at 1,854-58 ft., plugged back and completed for 3 bbl. per hr., 50 per cent water.

COLORADO COMPLETIONS

Wilson Creek, Rio Blanco County: Texas Co.-California Co. 12 Unit, NW NE SW 34-30n-94w, T.D. 6,600 ft., 7-in. 6,590 ft., perf. opposite Morrison sand, flowing 320 bbl. through ⅞-in. bean on tubing.

(Reported week ended March 20)

Boulder, Boulder County: Everett Swanson 1 Johnson SE 15-2n-70w. dry at 2,821 ft., through Hygiene.

WYOMING COMPLETIONS

Elk Basin, Park County: Ohio Oil Co. 4 Mack OPC-4, SE SW SE 30-58n-99w, T.D. 4,542 ft., 5½-in. 4,472 ft., flowed 30 bbl. an hour from the Tensleep.

(Reported week ended March 20)

Badger Basin, Park County: Resolute Oil Co. 3 Northern Pacific NE NW 17-37n-101w. Dry at 5,527 ft. without reaching the Wall Creek.

McCullough Peaks, Park County: Trigood Oil Co. 1 Wilson NW NE NW 28-54n-100w. T. D. 2,012 ft., Dry in Fort Union formation.

West Central Texas

(Continued from Page 71)

1,440 ft. from W Lot 3, Sec. 9, J. A. Nabers Sur., elev. 1,773 ft., flow 1,320 bbl., pay 2,399 ft., Lower Hope lime, T.D. 2,410 ft.

(Reported week ended March 20)

Fields

Bluff Creek, Shackelford County: Roeser & Pendleton-Humble 7 (51) J. P. Morris, NW SE NE Sec. 205, E.T.R.R. Sur., I.P. 66 bbl., 5 bbl. water, pay 1,627 ft., T.D. 1,634 ft.

Cook, NW Extension, Shackelford County: Roeser & Pendleton and Continental Oil 5-A W. I. Cook Est., NW SW SW Sec. 139, E.T.R.R. Sur., elev. 1,756 ft., dry, T.D. 1,712 ft.

Eastland County: Jack Chamberlain 1 B. L. Hargus, center SW 40 acres of 178.5 acre tract, Sec. 2, Blk. 6, E.T.R.R. Sur., dry, T.D. 1,486 ft.

Nail, Shackelford County: R. H. Roark 4 J. H. Nail, 660 ft. from S, 2,640 ft. from W Sec. 135, E.T.R.R. Sur., elev. 1,691 ft., I.P. 25 bbl., T.D. 1,505 ft.

Stith, Jones County: Jones & Stasney, Fain & McGaha 1-B A. J. Canon, 330 ft. from S and E lines, Blk. 72, Lge. 126, DeWitt County School Lands, elev. 1,792 ft., showing 2,384-89 ft., sand 2,674-84 ft., dry, T.D. 2,713 ft.

Strawn, Palo Pinto County: Texas Pacific Coal & Oil 2 fee-Ryan, 2,900 ft. from N, 4,425 ft. from E, Isaac Ryan Sur., I.P. 4,500,000 cu. ft. gas, pay 2,985 ft., T.D. 2,995 ft.

OKLAHOMA

Apache Pool Extended; New Deep Pay Opened at Cement

WHILE the greater part of Oklahoma's field operations were routine throughout the week, extensions and new pay zones were reported in some areas.

Caddo County.—The Apache pool was carried another location northwest at Pure Oil Co. 1 Starr, NE NE SW 34-6-12w. It was completed in sand at 3,976-4,027 ft., flowing 179 bbl. of oil in 24 hours through ½-in. choke. This well brings the northwest end to within ¼ mile of the Texas Co.'s 1 Starr which found the sand dry at 4,128 ft. Also in Caddo County, Ray Stephens 1 Pierson, SE SW SE 35-6-10w, flowed 588 bbl. of 36.4-gravity oil in 8 hours, through open tubing. It opens a new deep pay zone in the southwest corner of the Cement pool.

Okfuskee County.—A good gas well was brought in at the Big Chief Drilling Co. 1 Price in SW SW 16-10n-9e, which flowed nearly 18,000,000 cu. ft. of gas a day at 1,250 lb. rock pressure. The well gaged some 2,000,000 cu. ft. of gas in the Hunton at 3,676 ft. but main pay was in the Viola at 3,889-3,948 ft.

OKLAHOMA COMPLETIONS

Wildcats

Comanche County: J. G. Beard 1 Homer Neese, SE NE NE 8-1n-9w, dry, T.D. 2,503 ft., sand 700 ft., limestone 2,082 ft.

Lincoln County: Wilcox 1 Blaney, SE NW NE 14-14n-5e, dry, T.D. 4,710 ft., Bartlesville 2,762 ft., Hunton 4,404 ft., Viola 4,554 ft., Wilcox 4,612 ft., second Wilcox 4,645 ft.

Las Tecas 1 Darby, SE SE SE 30-16n-5e, dry, T.D. 3,616 ft., Oswego 3,483 ft., Prue 3,550 ft.

H. L. Berkey No. 1, NW SW SW 27-17n-4e, dry, T.D. 3,010 ft., Layton 2,705 ft., Cleveland 2,960 ft.

Noble County: Atlantic 1 Boulden, SE SE SE 12-21n-2w, flowed 300 bbl., Misener sand 5,050-64 ft., T.D. 5,251 ft.

Pawnee County: Alladin Pet. 1 King, S½ NW SW 2-23n-5e, 2,000,000 cu. ft. gas, Oswego 2,685-2,709 ft., T.D. 3,635 ft.

Payne County: Oklahoma Gaso Plants 1 Potts, NW SE NW 9-18n-6e, pumped 48 bbl., Wilcox 3,586-99 ft., discovery of West Markham pool.

Fields

Apache, Caddo County: Pure 1 Starr, NE NE SW 34-6n-12w, flowed 179 bbl. in 24 hr., sand 3,976-4,027 ft.

Bearden, Okfuskee County: Big Chief 1 Price, SW SW 16-10n-9e, 17,775,000 cu. ft. gas, 1,250 lb., R.P., Viola 3,889-3,948 ft., T.D. 3,979 ft.

Bethel, Seminole County: Mealy-Wolfe 1 Alex, NE NW NE 17-9n-8e, dry, T.D. 3,331 ft., Booch 3,277 ft.

Bird Creek, Osage County: C. F. Hewitt No. 5, NE NE SW 22-21n-12e, dry, T. D. 1,926 ft., Bartlesville 1,240 ft.

Cement, Caddo County: Ray Stephens 1 Pierson, SE SW SE 35-6n-10w, flowed 588 bbl. in 8 hr., sand 5,579-5,697 ft., T.D. 5,753 ft.

Cleveland, Pawnee County: Sinclair-Prairie 15 Murphy, N½ SW NE 20-21n-8e, pumped 21 bbl., pay 2,362-2,444 ft.

W. Cromwell, Seminole County: Sherman et al 1 Heiskill, SE SW 2-10n-7e, dry, T.D. 3,581 ft., 500,000 cu. ft. gas in Cromwell at 3,547 ft.

Cumberland, Marshall County: Pure 1 Harris-116, SE NE SE 19-5s-7e, dry, T.D. 6,905 ft., McLi h 5,658 ft., sand 6,064 ft.

Glenn Pool, Creek County: Gulf 35 T. Berryhill, NW SE SE 9-17n-12e, pumped 2 bbl., 1,438-1,581 ft., T.D. 1,586 ft.

March, Payne County: Wood Oil 1 Ramsey, NE NE SE 19-18n-5e, dry, T.D. 3,973 ft., Wilcox 3,970 ft.

Osage City, Osage County: Moore Oil No. 2, N½ NE SE 34-22n-8e, pumped 10 bbl., Big lime 1,895-1,912 ft.

Pottawatomie County: Stanolind 1 Orr, SW SW 18-11n-5e, dry, T.D. 4,948 ft., in Woodford shale.

Seminole, Seminole County: Sinclair Prairie 3 Spencer, NW SE 13-9n-6e, flowed 105 bbl. through ¼-in. choke, Hunton 3,990-4,015 ft.

Swan, Seminole County: Comail Oil 2 Amason, SW SE NE 18-6n-6e, flowed 79 bbl., sand 2,612-30 ft.

Vanderslice, Creek County: Sunray 1 Jordan, SW NE 29-14n-7e, 1,750,000 cu. ft. gas, Prue 2,890-2,904 ft., T.D. 2,918 ft.

Wewoka Townsite, Seminole County: Jordan Pet. 1-A Harrison, N½ NE NW 17-8n-8e, flowed 60 bbl., Hunton 3,918-38 ft., T.D. 4,247 ft.

(Reported week ended March 20)

Fields

Avant, Osage County: Sinclair Prairie No. 68, SE NW NE 19-23n-12e, repressure well, T.D. 1,762 ft.

Cement, Caddo County: Ohio Oil 4 School Land, NW NE SE 13-5n-9w, salt water disposal well, input at 4,463-4,548 ft., T.D. 4,581 ft.

Cushing, Creek County: Sinclair Prairie 17 Gooden, NE NW SE 16-17n-7e, pumped 11 bbl., Bartlesville 2,630-2,722 ft.

J. E. Crosbie 4 Dailey, SE NW NW 12-18n-7e, flowed 72 bbl., pay 2,610-30 ft.

Magnolia 4 Jones, SW NE SW 36-18n-7e, 250,000 cu. ft. gas, Bartlesville 2,852-2,940 ft., T.D. 3,040 ft.

Glenn Pool, Creek County: Gulf 31 Clayton, SE NE SE 8-17n-12e, pumped 20 bbl., sand 1,517-1,674 ft., T. D. 1,680 ft.

Gulf 36 Berryhill, SW SE SE 9-17n-12e, pumped 184 bbl., sand 1,420-1,585 ft.

Nelagoney, Osage County: Four States No. 6, S½ NE 13-25n-10e, pumped 50 bbl., Oswego 1,496 ft., T.D. 1,526 ft., acidized.

Seminole, Seminole County: Oklahoma Oil 2 Tigis, SW NE 13-9n-6e, flowed 110 bbl., Hunton 3,981-4,007 ft.

Velma, Stephens County: Gulf 1 Hallmark, SW SW NE 15-1s-5w, dry, T.D. 1,443 ft.

Skelly 16-B Stiefel, NW SE NW 35-1s-5w, flowed 5 bbl. in 7 hr., 702-31 ft.

Miscellaneous

Creek County: Lavanaugh and Williams 1 Blakemore, SW NW SW 11-16n-10e, dry in Wilcox 2,983 ft.

Muskogee County: C. W. Garrett 1 Escoe, C SW 16-13n-17e, pumped 12 bbl., 1,778-85 ft.

Okmulgee County: Sooner Oil & Gas 1 Ricks, S½ NE SW 21-16n-11e, 1,330,000 cu. ft. gas, 500 lb. R.P., sand 1,931-43 ft.

Tulsa County: Culbertson et al 1 Granett, N½ SE SW 28-20n-14e, dry, T. D. 790 ft.

LOUISIANA GULF

Test in Beauregard Parish May Open New Field

NEW ORLEANS, La.—In a week barren of important developments, attention rested chiefly on General Crude Oil Co. 1 C. S. Baldwin, in the Bear area of Beauregard Parish, which was at total depth of 9,414 ft. in hard limy shale and running 5½-in. casing. Some observers were hazarding the prediction that production would be established, making the Baldwin the opener of the next coastal Louisiana oil field. The Bear area has held the interest of oil men for years, but General Crude's venture is the first serious test. Little has been given out concerning what was found in the hole.

Evangeline Parish.—Oil shows are reported to have been found by Roy Lee, trustee, in his Pine Prairie dome wildcat, 1 Crowell & Spencer Lumber Co., 35-3s-1w. At last report the well was below 9,500 ft., in shale. It was said to have entered the Sparta at 9,362 ft. and to have cored 22 ft. of that sand showing oil. This test is on the northwest flank of the dome. Danciger Oil & Refining Co. is building road for a wildcat test, 1 Hattie Haas, in the Reddell area, 22-4s-1w. It is to be a Wilcox test.

Iberia Parish.—Humble has resumed drilling operations at its 4 Petit Anse Co. in the Avery Island field, after setting surface pipe at about 2,500 ft. Humble recently abandoned 3 Petit Anse on this lease.

LOUISIANA GULF COAST COMPLETIONS

Fields

Bayou Sale, St. Mary Parish: Atlantic 1 St. Mary Parish Land Co., 17-16s-9e, O.W.W.O., old T.D. 11,879 ft., squeezed perf. 10,310-42 ft., drilled out to 10,348 ft., 263 bbl. through ⅛-in. choke, T.P. 1,800 lb., gas-oil ratio 685.

Eola, Avoyelles Parish: Amerada 2 Avoyelles Bank & Trust Co., 5-2s-3e, O.W.W.O., old T.D. 8,580 ft., new P.B. T.D. 7,502 ft., 164 bbl. through ¼-in. choke, T. P. 350 lb., gas-oil ratio 811, perf. 7,493-7,500 ft.

Horseshoe Bayou, St. Mary Parish: Texas 8 St. Mary Parish Land Co., 14-17s-9e, dry at 11,606 ft.

Lake Chicot, St. Martin Parish: Amerada & Phillips 5 State-Chicot, 25-11s-9e, 243 bbl. distillate through ½-in. choke, T.P. 1,400 lb., C.P. 0, gas-oil ratio 535, perf. 8,146-70 ft., T.D. 9,450 ft., P.B. 8,173 ft.

Paradis, St. Charles Parish: Texas 7 Edward Dannel, 39-14s-20e, 288 bbl. through 9/64-in. choke, T.P. 1,690 lb., gas-oil ratio 726, perf. 10,178-98 ft., T.D. 10,490 ft.

Pine Prairie, Evangeline Parish: C. & I. Production Co. 1 Sam Haas estate, 2-4s-1w, O.W.W.O., dual completion, old

(Continued on Page 92)

NEW BIO-DYNE TREATMENT FOR BURNS ...A NEW CONCEPT IN WOUND HEALING

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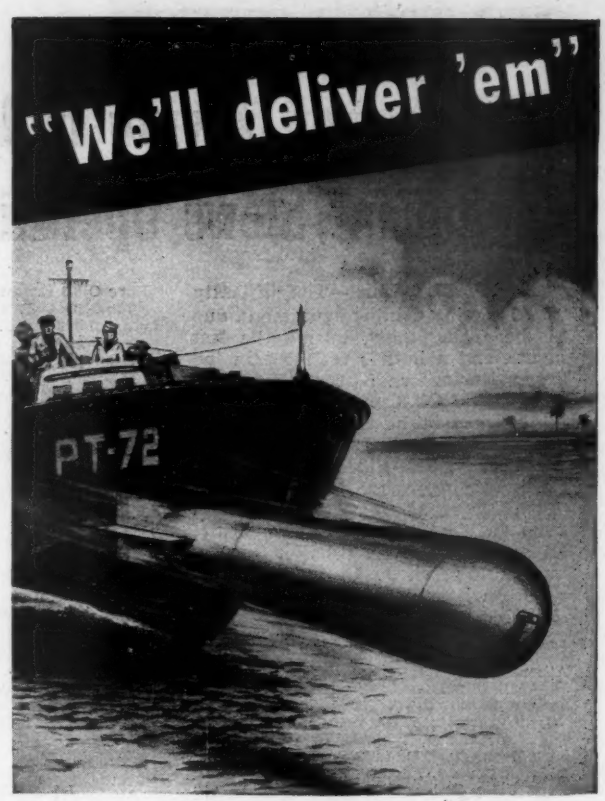

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OHIO, INDIANA, KENTUCKY

Difficulty of Moving Drilling Equipment Slows Operations

ZANESVILLE, Ohio.—The difficulty of moving drilling equipment, due to the spring thaw, during the last month and a half is reflected in the reduced number of completions this week. Ohio Oil Co. expects to reach the Oriskany sand this week in their wildcat in Center Township, Guernsey County. The Sinclair Prairie Oil Co. is drilling again after being shut down for repairs at 6,830 ft. on its deep wildcat in Olive Township, Meigs County. Brendel Oil & Gas Co. expects to reach the Clinton sand this week on its wildcat in Malta Township, Morgan County.

OHIO COMPLETIONS

Athens County, Carthage Township: H. B. Walker 2 Herman Taylor, Sec. 33, Berea, 80,000 cu. ft., T.D. 1,776 ft.

Lodi Township: Ohio Fuel 1 Nellie C. Bernard, Sec. 3, Macksburg 800 ft., 390,000 cu. ft., T.D. 1,053 ft.

Licking County, Eden Township: Lacknette 2 John Seiler, Sec. 25, Clinton, 250,000 cu. ft., T.D. 2,709 ft.

Lorain County, Huntington Township: H. C. Bishop 1 Lloyd Colley, Lot 1, Clinton, 489,000 cu. ft., T.D. 2,455 ft.

Wellington Township: Ohio Fuel 1 Melvin Holmes, Lot 13, Clinton, dry, T.D. 2,462 ft.

Medina County, Lafayette Township: Ohio Fuel 1 Russell Baker, Lot 15, Clinton, dry, T.D. 3,189 ft.

Monroe County, Malaga Township: Drumm & Ludwick 3 Henry H. Claus, Sec. 28, Berea, 68,831 cu. ft, T.D. 1,861 ft. (drilled deeper).

Muskingum County, Wayne Township: Atha 1 Muskingum Coal Co., Sec. 10, Clinton, dry, T.D. 4,125 ft.

Perry County, Clayton Township: Preston Oil 2 F. C. Rhoades, Sec. 7, Clinton, 37 bbl., T.D. 3,245 ft.

(Reported week ending March 20)

Coshocton County, Clark Township: Ohio Oil 2 Chas. R. Guthrie, Lot 12, Clinton, 271,000 cu. ft., T.D. 3,572 ft.

Holmes County, Richland Township: Ohio Fuel 1 C. M. Mackey, Sec. 4, Clinton, dry, T.D. 3,465 ft.

Lorain County, Pittsfield Township: Ohio Fuel 1 H. T. Breyley, Lot 143, Clinton, dry, T.D. 2,347 ft.

Medina County, Hinckley Township: Ohio Fuel 2 Grace La Croix, Lot 17, Clinton, 188,000 cu. ft., T.D. 3,289 ft.

Meigs County, Orange Township: Ohio Fuel 1 Chas. R. Randolph, Sec. 35, Berea, 34,000 cu. ft., T.D. 1,760 ft.

Morgan County, Marion Township: Bern O. & G. 19 C. I. Schofield, Sec. 2, Brill, dry, T.D. 1,100 ft.

York Township: Swingle 6 V. A. Stoneburner, Sec 19, Berea, 58,000 cu. ft., T.D. 1,202 ft.

Muskingum County, Wayne Township: Atha 1 John Smith, Sec. 10, Clinton, 110,000 cu. ft., T.D. 4,125 ft.

Noble County, Marion Township: Craig Cleary, 3 Roberta Cleary, Sec. 3, Berea, 4,891 cu. ft., T.D. 1,745 ft.

Perry County, Clayton Township: Industrial Gas 3 T. C. Rhoades, Sec. 5, Clinton, 140 bbl., T.D. 3,286 ft.

Pure Oil 3 Ernest F. Smitley, Sec. 8, Clinton, 185 bbl., T.D. 3,235 ft.

Palm Oil 1 John F. Tague, Sec. 22, Clinton, dry, T.D. 3,505 ft.

Industrial Gas 2 Martin Wood, Sec. 2 Clinton, dry, T.D. 3,498 ft.

Lyons et al 6 O. C. Barber, Sec. 10, Clinto, 1,171,000 cu ft., T.D. 4,812 ft.

INDIANA COMPLETIONS

Gibson County: Carroll Oil 4 Hy Crecelius, SE NW SE 36-1s-10w, dry at 1,501 ft., Cypress sand 1,480 ft., Oakland City sand 1,450 ft.

Posey County: Sun D-1 E. R. Greathouse, NW SE SE 30-4s-13w, dry at 2,974 ft., Kincaid 1,692 ft., Degonia 1,825 ft., Clore 1,960 ft., Menard 2,000 ft., Waltersburg sand 2,092 ft., Glen Dean 2,261 ft., Hardinsburg sand 2,291 ft., Golconda 2,386 ft., Cypress sand 2,561 ft., Benoist sand 2,701 ft., Aux Vases sand 2,830 ft., Ste. Genevieve 2,840 ft., McClosky 2,893 ft.

Central States 3 Hermson, SW SE NW 30-6s-12w, pumped 28 bbl., shot 967-1,020 ft., Pennsylvanian sand 967-1,025 ft., T.D. 1,161 ft.

Basin Drlg. et al 2 Oakland City College, NW SE NW 16-8s-14w, dry at 2,690 ft., Menard 1,848 ft., Glen Dean 2,049 ft., Ste. Genevieve 2,495 ft., McClosky 2,683 ft.

Carter 1 K. Schneider, SW SW 34-7s-14w, dry at 2,808 ft., Kincaid 1,660 ft., Menard 1,830 ft., Waltersburg 1,924 ft., Tar Springs 2,027 ft., Glen Dean 2,117 ft., Golconda 2,205 ft., Cypress 2,362 ft., Benoist 2,478 ft., Aux Vases sand 2,612, Ste. Genevieve 2,620 ft.

Spencer County: Damron Geary 1 W. H. Jones, NW NE SW 34-7s-7w, dry at 1,328 ft., Menard 932 ft., Glen Dean 1,135 ft., Golconda 1,233 ft., Jackson 1,318 ft., show oil 1,318-19 ft.

Vanderburg County: Superior 3 Nurrenbern, SW NW SW 32-6s-11w, pumped 50 bbl., shot 1,759-60 ft., Waltersburg sand 1,753 ft., T.D. 1,760 ft.

(Reported week ending March 20)

Dearborn County: Central U. S. Oil & Gas 1 H. Bobrink, NE NE SW 15-6n-1w, dry at 867 ft., Trenton 330 ft., St. Peter 810 ft.

Posey County: Cherry & Kidd 2 Walgrove Corp., SW NE NW 14-4s-14w., pumped 230 bbl., shot 2,610-20 ft., Cypress sand 2,604-40 ft., T.D. 2,997 ft., P.B. 2,623 ft., New Harmony extension.

C. A. Lennan 2 August Wolfe, NE NE NE 19-6s-12w, pumped 58 bbl., shot 2,340-50 ft., Cypress sand 2,323 ft., pay 2,338-51 ft., T.D. 2,351 ft.

Paul Rossi 1 Kineheloe, NE NE NW 35-5s-13w, dry at 2,967 ft., Kincaid 1,660 ft., Menard 1,971 ft., Waltersburg sand 2,069 ft., Glen Dean 2,229 ft., Golconda 2,350 ft., Cypress sand 2,520 ft., Aux Vases 2,774 ft., Ste. Genevieve 2,843 ft., St. Louis 2,964 ft.

Vanderburg County: Superior 2-A Nurrenbern, NE NW SW 32-6s-11w, pumped 70 bbl., Waltersburg sand 1,751-62 ft., T.D. 1,762 ft.

EASTERN KENTUCKY

ASHLAND, Ky.—A midmonth report available for the first time in the past few months shows the completion of 2 oil wells and 17 gas wells in the eastern Kentucky area in the past few weeks.

Two dry holes were also reported and a study of the report reveals a slight increase in drilling operations in most parts of the region with a number of wells now near completion stage.

The oil wells were light producers while the gas wells have a combined daily open flow of 8,566,000 cu. ft. of gas daily.

Martin County.—Warfield Natural Gas Co. has completed well No. 4708 on the Congregations Church Bld. Soc. tract on Elk Creek at a total depth of 2,614 ft. with an open flow of 315,000 cu. ft. of gas from shale and 119,000 from lime.

Floyd County. — Kentucky - West Virginia Gas Co. reports a dry hole with well No. 5433, Mitchell Blankenship, Bed's Fork of Frazier Creek, reaching total depth of 3,192 ft. in shale.

Pike County.—Columbian Fuel hit a dry hole in well 5049, Smith heirs, No. 12 tract on Left Fork of Meathouse Branch, at a total depth of 3,120 ft. in shale, P.P.&A.

Other Columbian completions are as follows: Pike County: 4543, Joe B. Smith 2, GW-868, 328,000 cu. ft. of gas daily open flow, 3143 ft. total depth, Berea, O.W.D.D. 879, Chesapeake Mineral Co., Tract 3, Daniels Fork, dry hole, total depth 3,970 ft. GW-873, Smith heirs No. 6, 858,000 cu. ft. gas daily open flow, 2,151 ft. total depth, Maxon, O.W.D.D. GW-898, Farrel & Hatcher, Bill Williams Creek, 391,000 cu. ft. gas open flow, Big lime, total depth 2,499 ft. GW-1204, Will Justice, Island Creek, 6 bbl. of oil, 103,000 cu. ft. of gas open flow, shale, total depth 3,251 ft.

Ford Motor Co. GW-1202, Dial Branch of Blackberry Creek, open flow of 268,000 cu ft. gas, Big lime, total depth 2,645 ft. GW-888, Lewis Deskine, 1,021,000 cu. ft. of gas daily open flow, Big lime, total depth of 2,151 ft.

Ford Motor Co. GW-1203, Blackberry Creek, dry hole at 3,975 ft.

United Carbon Co. has completed well No. 1090, Mason Coal & C. Co., Levisa Fork, at total depth of 3,969 ft. with a daily open flow of 377,000 cu. ft. of gas.

Knott County.—Hamilton Gas Co. reports the completion of well E-28, J. L. Triplett, Tract 2, at total depth 2,989 ft. in shale with daily open flow of 189,000 cu. ft. of gas.

Clay County.—Petroleum Exploration Co. has completed 1-927, John Spurlock, at total depth 1,748 ft. with daily open flow of 1,000 cu. ft. gas from Corniferous and also 1-925, H. M. Hensley, total depth of 1,773 ft. Corniferous with daily open flow of 380,000 cu. ft. gas.

Pike County.—Operator Kindred

(Continued on Page 82)

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CALIFORNIA

New Gas Field Indicated in Lodi District of San Joaquin County

LOS ANGELES, Calif. — Amerada Petroleum Corp. has apparently found a new commercial gas accumulation in the Lodi district of San Joaquin County and, unless all present signs fail, California should have two new gas fields within the next 30 days as Texas Co. has just about finished making the series of tests involving 1 Gill in the Mendota district of Madera County. On a formation test made several days ago, Amerada's 9-1 Lodi Community in 9-4n-7e showed a steady blow approximating 10,000,000 cu. ft. of gas per day from a perforated section at 2,580-90 ft. This wildcat was carried down to 4,471 ft. at which point basement granite was encountered and has a string of 8⅝-in. casing cemented at 2,595 ft. A spray of salt water accompanied the gas flow on the formation test but this is expected to be corrected before completion.

Mendota Area

In the Mendota area, Texas Co. has been making a series of tests and a short time ago proved up the existence of a second probably productive gas sand. If subsequent development work proves this to be the case, Mendota may prove to be an accumulation of considerable economic importance. The first gas sand found in this well was at 4,419-4,517 ft. and on a formation test this zone proved to be good for about 10,000,000 cu. ft. of gas. The second gas zone was found at 5,200-20 ft. and this horizon on a formation test indicated a potential daily production of 7,000,000 cu. ft. Between these two gas zones, Texas Co. cored a soft, well-saturated oil sand at 4,527-62 ft. and this zone may prove productive at some other location on the structure. As the situation stands at present, Texas has two gas sands that show every evidence of resulting in commercial gas production and an oil sand that may possibly prove productive higher up structurally. The first gas sand at 4,419-4,517 ft. and the oil sand at 4,527-62 ft. are in formations of Eocene age and the lower gas sand is in the Cretaceous. Top of the Eocene was cored at 4,419 ft. and top of the Cretaceous was found at 5,100 ft. Texas carried 1 Gill down to 9,154 ft. and has 7-in. casing cemented at 7,967 ft. The tests being carried out consist of perforating the 7-in. casing and then squeezing the perforations if they prove wet or otherwise unfavorable.

SAN JOAQUIN VALLEY COMPLETIONS

Antelope Plains, Kern County: Shell Oil Co., Inc., 56-6 Williams, 6-28s-20e, pumped 58 bbl. net, 17.1-gravity, 52 per cent cut, T.D. 2,307 ft., P.B. 2,240 ft., perf. 2,183-2,240 ft., completed in Williams sand of Miocene age.

Texas Co. 503-6 Voight, 6-28s-20e, flowed 428 bbl., 17.2-gravity, 2 per cent cut, 37/64-in. bean, pressure 50/300 lb., T.D. 2,308 ft., perf. 2,176-2,306 ft., completed in Williams zone of Miocene age.

Belridge, South, Kern County: General Petroleum Corp., 23-3 Belridge, 3-29s-21e, pumped 40 bbl., 13.9-gravity, 20 per cent cut, T.D. 1,029 ft., perf. 624-753 ft., 893-1,018 ft., completed in South Belridge zone of Pleistocene age.

General Petroleum Corp. 41-12 Belridge, 12-29s-21e, pumped 64 bbl., 13.3-gravity, 22 per cent cut, T.D. 1,070 ft., perf. 898-981 ft., 1,024-69 ft., completed in South Belridge zone of Pleistocene age.

Coalinga, East, Fresno County: Shell Oil Co., Inc., 176-26 fee, 26-19s-15e, pumped 60 bbl. net, 19.9-gravity, 20 per cent cut, T.D. 3,567 ft., perf. 3,283-3,406 ft., 3,506-64 ft., completed in East Coalinga zone of Miocene age.

Coalinga, West, Fresno County: Texas Co. 5-C fee, 6-20s-15e, pumped 79 bbl., 16.9-gravity, 6 per cent cut, T.D. 2,387 ft., P.B. 2,236 ft., 40 mesh perf. 2,163-2,209 ft., completed in West Coalinga zone of Pliocene age.

Helm, Fresno County: Amerada Petroleum Corp. 1-28-F Clover, 28-16s17e, abandoned in Cretaceous gray sand, T.D. 8,500 ft., no oil or gas showings logged.

Kern River wildcat district, Kern County: General Petroleum Corp. 1 Kernco, 1-29s-28e, abandoned in gray sand, T.D. 4,159 ft., upper Vedder zone of Miocene age 3,870 ft., lower Vedder zone 4,100 ft., no oil showings logged.

Kern Front, Kern County: Standard Oil Co. 19-5 fee, 5-28s-27e, pumped 107 bbl. net, 14.2-gravity, 15 per cent cut, T.D. 2,865 ft., 100 mesh perf. 2,673-2,863 ft., M point 2,482 ft., N point 2,603 ft., P point 2,622 ft., Q point 2,673 ft., R point 2,700 ft., S point 2,825 ft., completed in Kern Front zone of Pliocene age.

Westates Petroleum Corp., 37 Cauley, 16-28s-27e, pumped 145 bbl., 15-gravity, 0.5 per cent cut, T.D. 2,878 ft., 125 mesh perf. 2,824-78 ft., M point 2,496 ft., N point 2,620 ft., P point 2,642 ft., Q point 2,698 ft., R point 2,739 ft., S point 2,820 ft., completed in Kern Front zone of Pliocene age.

Lost Hills, Kern County: Universal Consolidated Oil Corp. 17 fee, 30-26s-21e, pumped 15 bbl., 17-gravity, 25 per cent cut, T.D. 1,613 ft., 80 mesh perf. 1,086-1,613 ft., completed in Lost Hills zone of Pliocene age.

Midway-Sunset, Kern County: Chanslor-Canfield Midway Oil Co. 10-7 fee, 7-32s-23e, abandoned in gray sand, T.D. 3,870 ft., no oil showings logged.

Chanslor-Canfield Midway Oil Co. 50-9 fee, 9-32s-23e, pumped 10 bbl. net, 15.8-gravity, 50 per cent cut, T.D. 1,600 ft., gun perf. 1,175-1,260 ft., 1,280-90 ft., 1,416-1,510 ft., may undertake squeeze job on perf. to shut off water, completed in Midway zone of Pliocene age.

Marvic Associates 4 Midway-Sunset front, 16-31s-22e, pumped 12 bbl., 13-gravity, 10 per cent cut, T.D. 1,316 ft., P.B. 1,285 ft., 400 mesh perf. 1,195-1,316 ft., completed in Midway front zone of Pliocene age.

Standard Oil Co. 96-7-D fee, 7-32s-24e, pumped 22 bbl., 15.8-gravity, 30 per cent cut, T.D. 3,070 ft., 60 mesh perf. 2,900-3,068 ft., completed in Midway zone of Pliocene age.

Vedder Petroleum Co. 9-2 Front, 9-31-22e, pumped 30 bbl., 12.9-gravity, 25 per cent cut, T.D. 1,184 ft., 200 mesh perf. 987-1,184 ft., completed in Midway front zone of Pliocene age.

Posuncula wildcat district, Kern County: Shell Oil Co., Inc., 84-27-B Kern County Land, 27-30s-26e, abandoned in gray sand, T.D. 8,370 ft., Stevens zone of Miocene age at 8,005 ft., was barren gray sand, no oil or gas showings logged.

Rio Vista gas field, Solano County: Standard Oil Co. 5 Perry Anderson, 35-4n-2e, flowed 16,500,000 cu. ft. dry gas, no oil, 48/64-in. bean, flow pressure 1,625/1,530 lb., shut-in pressure 1,638/1,645 lb., T.D. 4,480 ft., 60 mesh perf. 4,161-4,479 ft., green sand 4,180 ft., white sand 4,330 ft., completed in Emigh zone of Eocene age.

Round Mountain wildcat district, Kern County: Trico Oil & Gas Co. 1 Howell, 32-28s-29e, abandoned in gray sand, T.D. 2,542 ft., Vedder zone of Miocene age topped at 2,315 ft., was barren and consisted of gray sand, no important showings of oil or gas logged.

(Reported week ended March 20)

Belridge, South, Kern County: General Petroleum Corp. 35-12 Belridge, 12-29s-21e, pumped 11 bbl., 13.2-gravity, 70 per cent cut, T.D. 1,085 ft., 100-mesh perf. 894-1,084 ft., completed in South Belridge zone, Pleistocene.

General Petroleum Corp. 27-3 Belridge, 3-29s-21e, pumped 40 bbl. net, 13.5-gravity, 33 per cent cut, T.D. 1,022 ft., perf. 654-812 ft., 853-72 ft., 932-57 ft., 996-1,021 ft., completed in upper Belridge zone of Pleistocene.

Coalinga, East, Fresno County: Shell Oil Co., Inc. 166-29 fee, 29-19s-15e, pumped 242 bbl., 22.1-gravity, 8.4 per cent cut, T.D. 2,398 ft., 60-mesh perf. 2,350-96 ft., completed in East Coalinga zone, Miocene.

Shell Oil Co. 188-26 fee, 26-19s-15e, pumped 64 bbl., 22.4-gravity, 65 per cent cut, T.D. 3,659 ft., perf. 3,364-3,503 ft., 3,614-57 ft., black shale 3,347 ft., completed in East Coalinga zone, Miocene.

Kern Front, Kern County: Ohio Oil Co. 15 Midway Premier, 32-27s-27e, pumped 70 bbl. net, 13.9-gravity, 50 per cent cut, T.D. 2,739 ft., 120-mesh perf. 2,565-2,759 ft., Macoma claystone 2,409 ft., N point 2,495 ft., Q point 2,562 ft., completed in Kern Front zone, Pliocene.

Standard Oil Co. 37-15 fee, 15-28s-27e, pumped 122 bbl., 14-2-gravity, 30 per cent cut, T.D. 2,210 ft., 100-mesh perf. 2,002-2,208 ft., completed in Kern Front zone, Pliocene.

Midway-Sunset, Kern County: R. S. Miesse 1 Holladay, 15-32s-23e, pumped 72 bbl., 17.9-gravity, 2.5 per cent cut, T.D. 1,968 ft., gun perf. 1,495-1,503 ft., 1,535-50 ft., 1,760-65 ft., completed in Midway-Sunset zone, Pliocene.

North American Oil Consolidated 39 Lockwood, 16-32s-23e, pumped 30 bbl., 12.6-gravity, 6 per cent cut, T.D. 1,094 ft., P.B. 1,018 ft., 200-mesh perf. 504-1,016 ft., completed in Midway-Sunset zone, Pliocene.

Mountain View wildcat district, Kern County: Di Giorgio Fruit Co. 3 Mountain View, 7-31s-30e, abandoned in basement granite, T.D. 1,775 ft., bailed water with little oil, not commercially productive, will drill another test in 10-31s-29e.

Mount Poso, Kern County: Chanslor-Canfield Midway Oil Co. 22 Mon, 26-27s-28e, abandoned in barren gray sand, T.D. 1,662 ft., Vedder zone, Miocene, at this location consisted of gray sand, no showings logged.

Riverdale, Fresno County: Amerada Petroleum Corp. 76-22 Cerini, 22-17s-19e, flowed 243 bbl., 36-gravity, 1.2 per cent cut, 169,000 cu. ft. gas, 14/64-in. bean, pressures 500/550 lb., T.D. 6,900 ft., gun perf. 6,660-68 ft., completed in Lawton zone, Miocene.

Amerada Petroleum Corp. 34-15 Young, 15-17s-19e, flowed 215 bbl., 41.1-gravity, 1.3 per cent cut, 1,382,000 cu. ft. gas, 12/64-in. bean, pressures 2,000/2,075 lb., T.D. 7,100 ft., perf. 6,545-65 ft., 6,580-90 ft., 6,595-6,620 ft., McClure shale 5,224 ft., top Temblor 5,504 ft., completed in Lawton zone, Eocene.

Round Mountain, Kern County: Honolulu Oil Corp. 22 Round Mountain, 18-29s-29w, pumped 108 bbl., 14-gravity, 45 bbl net, T.D. 2,160 ft., 100-mesh perf. 2,137-59 ft. completed in Vedder zone, Miocene.

LOS ANGELES BASIN

Los Angeles County.—Shell Oil Co., Inc., is nearing 6,000 ft. in 1 Verne Community in the Salt Lake field and should begin finding some showings very soon as the objective of the well is 7,000-9,000 ft. although if the formation at these depths continues favorable drilling will obviously go on. There is some question as to how deep this well can go before reaching the basement which outcrops nearby in the Santa Monica Mountains as they cross from west to east. Shell's well is not more than 3 or 4 miles away from this granite mass which forms the basement. Good progress has been made during the past several weeks, after recovering from a fishing job which required the landing of surface pipe to prevent a joint of casing from falling back in the hole. If Miocene production is developed in this deep test it may lead to additional drilling outside of the area covered by Shell's program either through the deepening of present wells to the west or the drilling of new wells in that area which is still producing from the upper zone. Shell's present well will of necessity be drilled to the basement even though a good oil sand is found before reaching the granite as it is necessary that a complete section be made available in order to be able to predicate future drilling and to warrant the construction of a costly sound-proof building to house all drilling equipment.

The Los Angeles Park Commission took under advisement several days ago a bid of Seaboard Oil Co. calling for 21 per cent royalty to the city for the privilege of developing subsurface formations in the Elysian Park area. The commission was informed that Seaboard had leased adjacent property and would develop the park property by directionally drilled wells located on the leased property adjoining the park. Seaboard made the only bid as it was really the only operator that had direct access to the park. Developments indicate that it will be necessary for the federal Government either through the Navy or PAW to express an opinion that this drilling is necessary before some of

(Continued on Page 92)

SOUTHWEST TEXAS

Two Jim Hogg County Wildcats Brought In As Producers

CORPUS CHRISTI, Tex.—Two Jim Hogg County wildcats have come in as producers, and two in Starr County look like strikes. Both the Jim Hogg tests are operations of Sun Oil Co., which is active in that area. Sun 4-A East, 8½ miles southeast of the Colorado field, in the Santo Domingo de Arriba grant, flowed 96 bbl. of oil through 5/32-in. choke from perforations at 4,731-33 ft., on a 24-hour potential test, with tubing pressure of 300 lb., shut-in casing pressure of 1,000 lb., and gas-oil ratio of 686. Total depth is 4,736 ft. Sun 3 Weil Brothers, 16 miles south of Hebbronville, in the Palitos Blancos grant, flowed 8 bbl. of oil and 17 bbl. of salt water on a 24-hour potential test, through ⅛-in. choke. Tubing pressure was 1,500 lb., shut-in casing pressure 1,500 lb., and gas-oil ratio 51,375. Top of the pay was found at 5,002 ft. Total depth is 5,193 ft., plugged back to 5,058 ft. The pay is believed to be in the Cockfield.

Starr County.—Much interest is manifested in the 1 E. P. Caffarelli, drilled by I. K. Howeth et al, 10½ miles north of Rio Grande City. A core test at 3,612-26 ft. yielded a 6-ft. section which showed encouraging saturation. A 7-in. oil string has been set at 3,608 ft., and it was planned to make a production test as soon as the cement had hardened. Total depth was 3,626 ft. T. E. Stephens 1 Gonzales heirs, 10 miles north of Roma, was reported at the week end to be making gas, oil, and drilling water at 4,495-4,520 ft. Total depth was 5,378 ft.

Jim Wells County.—Sam E. Wilson, Jr., and D. Auld 1-A Maria S. de Garza, wildcat test 5 miles northeast of Falfurrias, was still testing after drilling to total detph of 8,211 ft., plugged back to 7,931 ft. The well was capped and showed shut-in casing pressure of 4,000 lb. It then was opened through 7/64-in. choke on one wing of the christmas tree and ⅛-in. on the other. At latest report the well was flowing gas, distillate and salt water, with tubing pressure of 2,800 lb. and shut-in casing pressure of 3,100 lb. Humble Oil & Refining Co. 1 M. A. Evetts, wildcat 2 miles north of Magnolia City, was at 2,156 ft. in shale, and reaming.

Karnes County.—On a 10-minute drill-stem test at 4,120-24 ft., Transwestern Oil Co. 1 H. T. Sellers, wildcat test 6½ miles southeast of Runge, was reported to have recovered 200 ft. of oil in the Pettus sand. This was the first oil show encountered.

SOUTH TEXAS COMPLETIONS

Wildcats

Duval County: Highland Oil Co. 1 I. Serna, B.S.&F. Sur. 523, A-134, dry at 3,410 ft.

Jim Hogg County: Sun 4-A East, 8½ miles southeast of Colorado field, 96 bbl. through 5/32-in. choke, T.P. 300 lb., S.I., C.P. 1,000 lb., gas-oil ratio 686, perf. 4,731-33 ft., T.D. 4,736 ft., discovery.

Sun 3 Weil Bros., 16 mi. S of Hebronville, 8 bbl. through ⅛-in. choke, T.P. 1,500 lb., S.I., C.P. 1,500 lb., gas-oil ratio 51,375, T.D. 5,193 ft., P.B. 5,058 ft., discovery.

Live Oak County: Bridwell Oil Co. 1 F. W. Jones, 6 mi. S of Clareville, dry at 4,480 ft.

Webb County: Humble 1 D. Benavides et al, 2 mi. N of Nescadito, dry at 7,043 ft.

Fields

Casa Blanca, Duval County: Transwestern Oil Co. 31 D.C.R.C. Sur. 293, G.C.&S.F. R.R. Sur 293, A-1085, dry at 1,931 ft.

East Benevides, Duval County: Hiawatha Oil & Gas Corp. 4-A George B. Parr, San Andres grant, A-657, 33 bbl. distillate and 11,500,000 cu. ft. gas through ¼-in. choke, T.P. 1,820 lb., C.P. 1,900 lb., T.D. 5,787 ft.

McLean, Webb County: Wise & Fallis 1 Frost National Bank, C.&M.R.R. Sur. 611, A-969, dry at 3,426 ft.

Sejita, Duval County: Standard Oil Co. of Texas 2 Jack Casey, Charco Redondo grant, O.W.W.O., old T.D. 5,891 ft., drilled ou to 5,885 ft., 152 bbl. through ⅛-in. choke, T.P. 900 lb., gas-oil ratio 650, perf. 5,810-14 ft. (Drilled by Trinity Gas Co., changed from gas well to oil well.)

South Campana, McMullen County: Magnolia 5 P. G. Kynette, B.S.&F. Sur. 101, A-138, 9,400,000 cu. ft. dry gas, S.I., T.P. 1,000 lb., S.I., C.P. 1,000 lb., perf. 3,008-9 ft., T.D. 3,050 ft.

Washburn, La Salle County: Quintana Petroleum Co. 18 South Texas Syndicate, H.&G.N.R.R. Sur. 87, A-243, 454 bbl. through ¼-in. choke, T.P. 540 lb., C.P. 240 lb., gas oil ratio 60, T.D. 5,540 ft.

(Reported week ended March 20)

Fields

Aviator, Webb County: Dulup Oil Co. 3 Puig Bros., Alberca de Arriba grant, 100 bbl. pumping, T.D. 1,884 ft.

North Sweden, Duval County: Benedum-Trees Oil Co. 22 F. V. Puig heirs, San Andres grant, A-657, dry at 6,005 ft.

S. White Creek, Live County: Joe Stelzig et al 1 J. W. Hoelscher, B.S.&F. Sur. 15, dry at 1,848 ft.

LOWER GULF COAST COMPLETIONS

Fields

Seeligson, Kleberg County: Humble 14 King Ranch Cabeza, G.H.&H.R.R. Sur., 115 bbl. through ⅛-in. choke, T.P. 850 lb., gas-oil ratio 499. T.D. 5,997 ft.

Stratton, Nueces County: Cox & Hamon 1 W. T. Davis, Paso Ancho de Abajo grant, 83 bbl. through 6/54-in. choke, T.P. 800 lb., C.P. 1,040 lb., gas-oil ratio 500 lb., perf. 6,530-40 ft., T.D. 6,686 ft.

(Continued on Page 81)

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TEXAS GULF COAST

Oil Sand in Katy Area Creates Development Problems

HOUSTON, Tex.—Center of interest in the Gulf Coast territory continued this week to be Stanolind Oil & Gas Co. 1 G. T. Pattison, in the Bennett Survey, Waller County, where an oil-producing sand has been opened 2½ miles from the nearest gas production in the big Katy field. The discovery has created development problems which are a subject of discussion among operators in the Katy area and officials of the Petroleum Administration for War. The area, since the discovery well was completed in 1935, has been considered a gas and distillate producer only. As well-spacing rules in gas fields differ from those in oil fields, new regulations for development of both the gas and the oil possibilities of the Katy area must be adapted or exceptions to existing rules granted. The Pattison test flowed at the rate of 144 bbl. of 44.5-gravity oil through ⅛-in. choke from perforations at 6,622-25 ft. It also found gas and distillate sands at 7,338-45, 7,116-21, and 6,847-51 ft. A test north of the Pattison was abandoned several years ago after encountering salt water above the 6,600-ft. level. A meeting of Katy operators and PAW officials was held in Houston Saturday to consider problems created by the discovery of an oil sand in a district supposedly productive of gas and distillate only.

Jackson County.—Production has been opened by W. Stewart Boyle and Sterling Oil & Refining Co. in their 1 Dr. M. D. Levy, 3½ miles southeast of Ganado, but its volume has not been established. The well is bottomed at 6,502 ft. in shale and sand. Perforations at 4,858-61 ft. were squeezed, and a split in the casing was found at 3,500-03 ft. As the week closed, the crew was trying to make a squeeze job. The state Railroad Commission granted Mr. Boyle's request to name the new field Sterling. Shield Oil Co. 1 Henderson & Pickering, 5 miles northwest of the La Salle field, is at 6,027 ft. in shale. Oil odor was found at 4,685-87 ft. The well is waiting on orders.

Colorado County.—Magnolia Petroleum Co. 1 Anderson Brothers, 1½ miles southwest of Chesterville, was preparing to make a drill-stem test after getting gas odor at 6,485 ft. This well found the Cockfield at 5,898-5,918 ft., Discorbis Yeguaensis 6,025-35 ft., and Eponides Yeguaensis 6,142-52 ft.

Matagorda County.—Superior Oil Co. of California 1 F. B. Peterson, 3 miles northeast of Van Vleck, was still fishing for drill pipe stuck 4,590 ft. off bottom. The well is at 10,702 ft. in sand.

Wildcat operations.—New work has been started by Northern Ordnance, Inc., 5 miles southeast of Batson, Hardin County; John B. Coffee and associates 1 Mrs. Rose York, 3½ miles southeast of Ganado, Jackson County; Continental Oil Co. 1 S. G. Anderson, 1½ miles southeast of Citrus Grove, Matagorda County.

TEXAS GULF COAST COMPLETIONS

Wildcat

Chambers County: Glenn H. McCarthy, Inc., et al 1 Philo Broussard, A-16, 1 mi. SE of Winnie, dry at 9,015 ft.

Fields

Barbers Hill, Chambers County: Mills Bennett Production Co. 10 Barrow, William Bloodgood Sur. A-5, O.W.W.O., old P.B. T.D. 4,068 ft., dry at new P.B. T.D. 4,015 ft.

Sun 11 Chambers County Agriculture Association, O.W.W.O., old P.B. T.D. 3,855 ft., dry at new P.B. T.D. 1,879 ft.

Sun 1 A. Higgins, O.W.W.O., old P.B. T.D. 5,310 ft., new P.B. T.D. 5,261 ft., 464.92 bbl. through ¼-in positive choke, T.P. 625 lb., gas-oil ratio 253, perf. 5,194-5,260 ft.

Esperson, Liberty County: General Crude oil Co. 3 R. A. Welch-fee, M. Duncan Sur. A-29, 768 bbl. through ¼-in. choke, T.P. 1,400 lb., S.I. C.P. 1,400 lb., gas-oil ratio 876, perf. 8,400-30 ft., T.D. 9,518 ft., P.B. 8,510 ft.

Ganado, Jackson County: Texas 1 F. W. Sillman, A. Kountze Sur. A-229, 10 bbl. on gas lift, perf. 5,092-5,106 ft., T.D 6,660 ft.

North La Ward, Jackson County: H. Merlyn Christie 1 J. A. Graves, P. Scott Sur A-69, 104 bbl. through 7/64-in. choke T.P. 400 lb., C.P. 800 lb., gas-oil ratio 300, perf. 5,204-06 ft., T.D. 5,252 ft

Sour Lake, Hardin County: E C. Hankamer et al 1 Yount et al, S. Jackson Sur. A-34, 134 bbl. through 10/64-in. positive choke, T.P. 165 lb., S.I. C.P. 85 lb., perf. 2,176-89 ft., T.D. 2,248 ft., P.B. 2,195 ft

Texana, Jackson County: Hewett & Daugherty 1 J. C. Robertson, O.W.W.O., old T.D. 7,506 ft., squeezed old perf and drilled out to 6,035 ft, 1,500,000 cu. ft. gas through ⅛-in. choke, T.P. 1,275 lb., C.P. 1,275 lb., perf. 5,922-35 ft.

(Reported week ending March 20)

Fields

Fostoria, Montgomery County: J. A. Gray 1 Foster Lumber Co., P. Gill Sur., A-230, dry at 6,024 ft.

Lake Creek, Montgomery County: Superior Oil Co. of California 5-A T. A. McWhorter, T. J. Nichols Sur., A-397, dua' completion; from perf. 9,230-45 ft. 262 bbl. through ¼-in positive choke, C.P. 1,600 lb., gas-oil ratio 7,442 ft.; from perf. 9,754-93 ft. 333 bbl. distillate through ¼-in positive choke, C.P. 2,200 lb., gas-oil ratio 6,378, T.D. 10,255 ft., P.B. 9,995 ft.

Oyster Bayou, Chambers County: Sun 8 Felix Jackson et al, T.&N.O.R.R. Sur. 124, A-149, dry at 8,437 ft.

Stowell, Jefferson County: Texas 1 Steele, E. Lopez league, A-37, 712 bbl. through ¼-in. by 6-in. positive choke, T.P. 1,300 lb., C.P. 400 lb., gas-oil ratio 618, perf. 7,840-50 ft., T.D. 7,921 ft., P.B. 7,858 ft.

Sinclair Prairie 2-A I. J. Smith et al, T.&N.O.R.R. Sur. 161, A-373, 248 bbl. through 12/64-in choke, T.P. 990 lb., gas-oil ratio 500, perf. 8,938-52 ft., T.D. 9,-120 ft., P.B. 8,956 ft.

Willow Slough, Chambers County: Sun 1-A Walter Hoffman, T.&N.O.R.R. Sur. 291, 45,000,000 cu. ft. gas through open tubing, T.P. 3,200 lb., S.I. C.P. 1,125 lb., perf 8,708-70 ft., T.D. 8,830 ft.

Illinois Fields

(Continued from Page 68)

Oil Co. 1 Shaffer, W½ SW SW 14-1s-6e, pumped 174 bbl. oil and 58 bbl. water, acidized, McClosky 3,161-64 ft., 3,184-92 ft., T.D. 3,198 ft., P.B. 3,170 ft.

South Lawrence, Lawrence County: C. F. Ross 1 Clifton Loogue, SW NE SE 26-2n-12w, dry at 1,385 ft.

South Mason, Effingham County: Brown et al 2 Tremble, NE NW SW 26-6n-5e, dry at 2,463 ft.

Walpole, Hamilton County: Texas 4 F. R. Wilson, SE SE SE 28-6s-6e, dry at 3,175 ft., Glen Dean 2,580 ft., Golconda 2,685 ft., Barlow 2,812 ft., Renault 3,106 ft., Aux Vases sand 3,124 ft.

West Inman, Gallatin County: Gulf Refg. 3 Leonard Bahl, NE SW SW 15-8s-9e, pumped 83 bbl., shot 2,494-2,500 ft., Cypress 2,490-95 ft., T.D. 2,500 ft.

Globe et al 1 Pilot-Hish, SE SE SE 16-8s-9e, pumped 46 bbl., shot 2,501-20 ft., Cypress sand 2,496-2,523 ft., T.D. 2,523 ft.

Woodlawn, Jefferson County: Magnolia 1 Reid-Grisson, SE NE SE 26-2s-1e, pumped 49 bbl. oil and 104 bbl. water, shot 2,017-20 ft., Benoist sand 2,014 ft., T.D. 2,024 ft.

Southwest Texas

(Continued from Page 79)

(Reported week ended March 20)

Fields

Bentonville, Nueces County: Southern Minerals Corp. 2-C Richard King, Agua Dulce grant, 70 bbl. through 7/64-in. choke, T.P. 850 lb., C.P. 1,550 lb., gas-oil ratio, 1,100, perf. 5,338½-42 ft., T.D. 5,611 ft.

North McFaddin, Victoria County: Union Producing Co. 1 J. D. Rowlett, J. Vairin Sur., location abandoned.

Seeligson, Jim Wells County: Republic Natural Gas Co. 1 Premont, Unit 8, B.S.&F. Sur. 361, 140 bbl. through 7/64-in choke, T.P. 900 lb., C.P. 1,200 lb., gas-oil ratio 550, perf. 6,086-91 ft., T.D. 6,122 ft.

Seeligson, Kleberg County: Humble 13 King ranch-Cabeza, A. G. King Sur., 113 bbl. through ⅛-in choke, T.P. 975 lb., C.P. 900 lb., gas-oil ratio 616, T.D. 6,010 ft.

Shield, Nueces County 1 G. R. Clark, A.M.& M. Sur., 149, 128 bbl. distillate and 3,182,-000 cu. ft. gas through ¼-in. choke, T.P. 2,200 lb., C.P. 2,425 lb, gas-oil ratio 29,-000, perf. 6,963-65 ft., T.D. 6,975 ft.

SOUTH CENTRAL TEXAS COMPLETIONS

Wildcats

Atascosa County: Hardcastle 1 C. C. Kingsley, 1 mi. W of Pleasanton, dry at 1,007 ft.

Bastrop County: Taylor Refining Co. 1 Alexander, 9 mi. S of Bastrop, dry at 2,094 ft.

Kimble County: Ben Banner 1 Frank Baker, 3½ mi. NE of Junction, dry at 1,790 ft.

Fields

Poth, Wilson County: Superior Oil Corp. 1 Chas. Boysen, A. Flores Sur., O.W.W.O., cleaned out to old P.B. T.D. 4,117½ ft., 15 bbl. pumping, perf. 4,090-97 ft.

KANSAS, NEBRASKA

Lansing and Arbuckle Lime Pools Opened in Stafford County

STAFFORD County accounted for two new oil pools last week. Eight miles east of Cities Service 1 English, gas discovery, and 5 miles west of the Jordan pool, the same company's 1 Grunder, SW NE NE 11-25-15w, pumped an average of 65 bbl. of oil and 35 bbl. of water in the Lansing-Kansas City lime topped at 3,780 ft., with pay at 3,917 ft., before water broke in. On last report it was making about 60 per cent water. Stanolind and Derby 1 Van Lieu, NE SE NE 20-24-13w, had Arbuckle lime at 4,080-88 ft., total depth, and filled 1,000 ft. with oil in 4 hours after drilling plug. It swabbed 11½ bbl. of oil an hour and had made potential of 104 bbl. a day. Location is about 1½ miles west of the St. John pool.

Other wildcat reports were: Helmerich & Payne 1 Savage, Decatur County, dry at 3,680 ft. and filling up with water. Westgate-Greenland 1 Dudendorf, NW NW SE 30-14-2w, south of Salina in Saline County, filled 1,700 ft. with oil and water from Viola at 3,222 ft. and pumped 15 bbl. of fluid an hour.

KANSAS COMPLETIONS

Wildcats

Barton County: Helmerich & Payne 1 Roesler, SE SE NW 14-18-11w, pumped 151 bbl., Arbuckle 3,291-98 ft., T.D. 3,313 ft., discovery of Roesler pool.

McPherson County: Adair & Morton et al 1 Johnson, SW NW SE 6-17-1w, dry, T.D. 2,747 ft., Mississippian chat 2,727 ft.

Osborne County: Carter Oil 1 Peter Neuschwanger, NE SW 15-8-14w, dry, T.D. 3,794 ft., Ft. Riley 1,840 ft., Topeka 2,798 ft., Lansing 3,060 ft., Viola 3,566 ft., Simpson sand 3,673 ft., Arbuckle 3,728 ft.

Sedgwick County: Aylward Prod. 1 Draper, N½ NE NE 34-29-2w, dry, T.D. 4,102 ft., Lansing 2,927 ft., Mississippi lime 3,600 ft., Misener 3,983 ft., Simpson 4,003 ft.

Stafford County: Faulkner and Atlantic 1 Rothgarn, E½ SW SE 10-21-13w, pumped 180 bbl., Arbuckle 3,569-75 ft., 3,584-88 ft., T.D. 3,609 ft., discovery of Southeast Shaeffer pool.

Fields

Chase, Rice County: Bishop Oil 1-A Callis, SE SE 16-19-9w, pumped 5 bbl., Lansing 2,938-46 ft., T.D. 3,265 ft.

C. H. Beaver 1-B Robbins, NE NE 19-19-9w, pumped 500 bbl., Arbuckle 3,256-66 ft.

David, Cowley County: Aylward Prod. 4 Hanlen, SE SW SE 26-30-4e, pumped 27 bbl., Bartlesville 2,950-67 ft.

Drach, Stafford County: Atlantic 2-B Hitz, NW SW 7-22-12w, pumped 180 bbl. in 18 hr., Arbuckle 3,672-79 ft.

El Dorado, Butler County: Allbe Oil 15 Dempsey, NW SW 11-26-4e, dry, T.D. 2,405 ft., pumped 20 bbl. oil and 60 bbl. water.

Iuka, Pratt County: Skelly 4-A Beck, SW NE NW 7-27-12w, pumped 154 bbl., Simpson 4,226-32 ft., 4,235-48 ft., T.D. 4,251 ft.

Greenvale, NW, Russell County: Magnolia 2 Trapp, SE NE NE 31-14-14w, pumped 662 bbl., Gorham sand 3,155-57 ft.

Keesling, Rice County: Cities Service 1-B McGlynn, SE NW 16-20-9w, pumped 326 bbl., Arbuckle 3,241-53 ft.

Cities Service 2-B McGlynn, SW NW 16-20-9w, dry, T.D. 3,314 ft., Arbuckle 3,281 ft.

Kipp, Stafford County: Skelly 1-F Kipp, S½ SW SE 22-25-14w, flowed 156 bbl., Lansing 3,827-3,907 ft., 3,484,000 cu. ft. gas.

Kraft-Prusa, Barton County: Branine & Goering 1 Radenberg, NE NE NE 17-17-11w, pumped 531 bbl., Arbuckle 3,303-05 ft.

Black-Marshall 2 Dolechek, NE NE SE 24-16-12w, pumped 64 bbl., Arbuckle 3,353-67 ft.

Armer and Vernon Oil & Gas 3 A. Hoffman, NE NE SW 18-16-11w, swabbed 50 bbl. an hr., potential 1,120 bbl., Arbuckle 3,323-36 ft.

Lindsborg, NW, McPherson County: Auto-Ordnance 2 Bean, W½ SE NW 36-17-4w, pumped 932 bbl., Viola 3,399-3,406 ft.

Lost Springs, Marion County: Sharon Drlg. 1 Rindt, N½ NE NE 3-18-4e, dry, T.D. 2,400 ft., Mississippi lime 2,375 ft.

Merten, Barton County: Transwestern Oil 1 Seeler, NW NE NW 10-19-15w, dry, T.D. 3,582 ft., Lamotte 3,529 ft., gaged 1,186,000 cu. ft. gas.

McLouth, Jefferson County: Lofquist 1 McLeod, NW SE SE 5-10-20e, pumped 50 bbl., Mississippi lime 1,656-60 ft.

Morel, Graham County: Cities Service 3-B Morel, NW NE NE 22-9-21w, 2,944 bbl., Arbuckle 3,754-60 ft.

Roxbury, McPherson County: Westgate-Greenland 3 Crowther, S½ SE NW 26-17-1w, dry, T.D. 2,864 ft., Mississippian chat 2,818 ft.

Silica, Rice County: Herndon Drlg. 3 Lola, SE SW 19-20-10w, dry, T.D. 3,351 ft., Arbuckle 3,341 ft.

Stoltenberg, Ellsworth County: Appleman et al 1 Jezek, N½ NE SE 7-16-10w, swabbed 19 bbl. an hr. natural, potential 1,050 bbl., Arbuckle 3,333-41 ft.

Ward, Pratt County: Appleman 1 Long, W½ NW SW 10-26-12w, dry, T.D. 4,325 ft., Arbuckle 4,291 ft.

Zenith, Reno County: Magnolia 3 Darr, SE NW 6-24-10w, flowed 223 bbl. in 12 hr., Viola 3,706-18 ft.

Zenith, Stafford County: Great Lakes Carbon 1 Ira Johnson, E½ SW NE 3-24-11w, pumped 160 bbl., Viola 3,693-3,735 ft.

(Reported week ended March 20)

Wildcats

Barton County: Texas 1 Lantermann, SW SW 27-19-11w, pumped 52 bbl., Arbuckle 3,333-61 ft.

Cowley County: Adair & Morton 1 Ahlerichs, NW NW SE 7-31-4e, dry, T. D. 3,311 ft., Bartlesville 2,865 ft., Mississippi lime 2,940 ft., Arbuckle 3,303 ft.

McPherson County: Palmer Oil 1 Graber, N½ SW SE 35-20-1w, dry, T. D. 3,630 ft., Mississippian chat 2,932 ft., Viola 3,446 ft. Simpson 3,504 ft., Arbuckle 3,596 ft.

Norton County: Helmerich & Payne 1 J. R. Smith, SE SE NE 36-3-23w, dry, T.D. 3,772 ft., Lansing 3,459 ft., Lamotte sand 3,714 ft., granite wash 3,729 ft., granite 3,761 ft.

Stafford County: Virginia Drlg. 1 Durham, SE SE NW 32-22-12w, dry, T.D. 3,780 ft., Lansing 3,355 ft., Viola 3,630 ft., Simpson 3,688 ft., Arbuckle 3,749 ft.

Fields

Ainsworth, Barton County: Stanolind 1 Stephen Reif, SE NW 36-16-13w, dry T.D. 3,428 ft., Arbuckle 3,406 ft.

Lindsborg, McPherson County: Carter Oil 3 E. Fornberg, W½ NW SW 18-17-3w, pumped 158 bbl., Viola 3,379-85 ft.

Auto-Ordnance 4 Bengstrom, W½ SE NE 25-17-4w, pumped 624 bbl., Viola 3,380-87 ft.

Morel, Graham County: Continental 3-A NW SW NW 14-9-21w, dry, T.D. 3,889 ft., Arbuckle 3,875 ft.

Ray, Phillips County: Cities Service 1 Griffin, SW SW NW 27-5-20w, 1,109 bbl., Arbuckle 3,619-22 ft., T.D. 3,687 ft.

Seeley-Wick, Greenwood County: Cities Service 5-A Cragan, NW SW NE 32-22-11e, pumped 37 bbl., Bartlesville 1,935-2,007 ft.

Silica, Rice County: J. D. Eckert 1-A Linville, NE NW SE 4-20-10w, dry, T.D. 3,359 ft., Arbuckle 3,356 ft.

Smyres, Rice County: Shade & Berry 2 Anderson, NE NW SW 25-19-6w, pumped 512 bbl., Mississippian chat 3,350-72 ft.

North Vernon, Sumner County: Brewer & Adams 1-A Buffington, SW SE SE 10-35-2e, 1,500,000 cu. ft. gas, Layton sand 2,785-2,800 ft., T.D. 3,494 ft., P.B. 3,200 ft.

Zenith, Reno County: Porter, Carpenter et al 2 Volker, NE SW 6-24-10w, flowed 600 bbl. in 24 hr., Viola 3,720-28 ft.

Zenith, Stafford County: D. R. M. Co. 1 Richardson, E½ NE NW 22-24-11w, flowed 66 bbl. in 3 hr., potential 1,093 bbl., Misener 3,839-43 ft., T.D. 3,888 ft.

NEBRASKA

ST. JOSEPH, Mo.—R. L. Ferguson and Edwin S. Towle had hopes for production at their 1 Della Ehbauer in NW NW NE 2-2n-15e, Richardson County, Nebraska, which they drilled to Hunton lime 2 miles north of Verdon. Three cores took the hole about 29 ft. in the lime, which was topped at 2,407 ft., and the drill then went about 50 ft. deeper before running electrical log. Some oil stains were found, pipe was cemented and gun perforation was ordered, but cement failed to hold and a test was delayed.

NEBRASKA COMPLETIONS

Wildcat, Antelope County, S of Neligh: F. Cave et al 1 Taylor, NE NE SW 31-25n-6w, dry, T.D. 2,100 ft.

Dawson, Richardson County: Frank Power 1 Bohrer, E½ SW NW 10-1n-14e, 85 bbl., T.D. 2,952 ft., P.B. 2,922 ft., recompletion.

Eastern Kentucky

(Continued from Page 76)

has completed 1 Lizzie Hunt heirs, Johns Creek, at total depth 2,871 ft. with daily open flow of 106,000 cu. ft. from Big lime and 694,000 open flow from shale. Utility Elkhorn Coal Co. reports completion of well No. 1, tract owned by company on Shelby Creek at total depth of 3,589 ft. with daily open flow of 400,000 cu. ft. of gas from Maxon and 1,277,000 from shale.

Martin County.—The completed log in shows 1 E. C. Ware on A. D. Preece, Tract 1, Little Crooker Branch of Wolf Creek, completed at total depth of 1,650 ft. in Big lime with

estimated production of 5 bbl. of oil daily. E. C. Ware has also completed well No. 4, Ward heirs on Left Fork of Elk Creek, at a total depth of 2,748 ft. with daily open flow of 119,000 cu. ft. of gas from shale. Diederich & Hale have completed well No. 1, Cassady heirs, Wolf Creek, at total depth of 1,289 ft. in Maxon with daily open flow of 316,000 cu. ft. of gas.

NORTH LOUISIANA

Extension Reported For Haynesville Field

THE Arkansas side of the Haynesville Pettit lime pool received an east extension at Navarro Oil Co.'s 3 Beene, N½ SW SE 3-20s-20w, which flowed 264 bbl. in 12 hours through ¼-in. choke. Perforations were made from 5,416-90 ft. The field is continuing its rapid expansion to the north with no limitation in sight at this time. The Louisiana Conservation Department announced nine permits for new wells last week.

ARKANSAS COMPLETIONS

Wildcats

Calhoun County: Placid Oil 1 Southern-International, NW SE 30-14s-14w, dry, T.D. 4,450 ft.

Lafayette County: W. G. Ray Drlg. 1 Warnock-LeCroy, SW SW 3-20s-24w, dry, T.D. 6,326 ft., Pettit 6,140 ft.

Fields

Fouke, Miller County: Carter Oil 1-F Sturgis, NW NE 11-17s-27w, pumped 96 bbl., perf. Sturgis sand 3,653-71 ft., T.D. 3,800 ft.

Hillsboro, Union County: D. V. Lacefield 4 Burnside, NW SE NE 24-18s-14w, pumped 30 bbl. oil and 10 bbl. water, T.D. 2,207 ft.

Haynesville, Columbia County: Navarro Oil 3 Beene, N½ SW SE 3-20s-20w, flowed 264 bbl. in 12 hr., ¼-in. choke, Pettit 5,416-27 ft., 5,477-90 ft.

Macedonia, Columbia County: Tide Water-Seaboard 1 Foreman-Whitlow, C N½ SW 21-18s-21w, flowed 186 bbl. distillate through choke, perf. 7,996-8,006 ft., T.D. 8,950 ft.

Stephens, Columbia County: R. H. Crow 1 Guttry, SW SW NE 11-15s-20w, dry, T.D. 2,550 ft., Tokio sand 2,462 ft.

Troy-Irma, Nevada County: Berry Asphalt 3 J. Haynie, NW SE SW 6-14s-20w, pumped 100 bbl., sand 1,238 ft., T.D. 1,245 ft.

NORTH LOUISIANA COMPLETIONS

Wildcats

Bossier Parish: Hunt Oil 1-A Pardee, NW NE 18-23n-11w, dry, T.P. 6,083 ft., perf. 5,942-63 ft., 5,976-6,014 ft., two acid treatments, swabbed salt water with slight oil show.

Red River Parish: O'Meara Bros. 1 Franklin Realty, E½ NE SW 24-11n-10w, dry, T.D. 3,344 ft., Nacatoch 1,218 ft., Blossom 1,822 ft.

Richland Parish: Crown Central Pet. 1 D. R. Sartor, NE SW 9-16n-6e, dry, T.D. 4,783 ft., Glen Rose 3,360 ft., Rodessa 3,600 ft., Pettit 4,235 ft., Travis Peak 4,520 ft.

Fields

Ajax, Natchitoches Parish: J. E. Watts 1 Fair, NW NW SE 18-10n-10w, dry, T.D. 3,401 ft.

Haynesville, Claiborne Parish: Midstates Oil 1 Goree-Wynn-Lewis, NE SE 27-23n-8w, flowed 102 bbl., Pettit 5,555-74 ft., 5,627-32 ft., T.D. 5,650 ft.

Nebo, La Salle Parish: H. L. Hunt 47-A Goodpine, SW SW 15-7n-3e, flowed 215 bbl. through choke, perf. 4,044-50 ft., T.D. 4,132 ft.

Shongaloo, Webster Parish: F. R. Sylvestre 1 O. H. Haynes, NE NW 29-23n-9w, dry, T.D. 6,032 ft., James 5,319 ft., Pettit 5,770 ft., Travis Peak 5,950 ft.

Sugar Creek, Claiborne Parish: Haynes R. Ownby 1 Camp-Blackwell, NE SW 12-19n-6w, dry, T.D. 6,083 ft., Travis Peak 5,600 ft., sand 6,037 ft.

MISSISSIPPI

JACKSON, Miss.—Pure Oil Co. 1 J. M. McDowell, 6 miles southwest of Natchez, in Adams County, was preparing to set packers above and below perforations at 10,280-83½ ft., for a test. This wildcat, now at total depth of 11,102 ft., had an oil show at 4,800 ft.

Humble Oil & Refining Co. 1-B L. N. Dantzler Lumber Co., 20-5s-8w, Jackson County, was waiting on cement after setting 10¾-in. casing at 2,572 ft. Total depth was 2,604 ft.

California Co. 1 G. T. Smith, 4-7n-7e, Lincoln County, set 1,719 ft. of 5-in. casing at 12,229 ft., where the well is now bottomed in shale.

CANADIAN FIELDS

Three Wells Planned to Test Bed of Lake Erie

CHATHAM, Ont. — In the Ontario fields, West Petroleum, Ltd., of Toronto, headed by D. R. Michener, is planning to drill three wells in the bed of Lake Erie, south of the old Tilbury-Romney gas field. Locations will be 5,900 ft. offshore from high-water mark, the central location being approximately opposite Lot 184, Talbot Road, Romney Township. Lake drilling has been undertaken in the past on the assumption that the producing formations extend a considerable distance under the lake and that substantial quantities of gas are trapped there. Previous tests in the lake bed, however, have been located only about 850 ft. offshore, or about 1,000 ft. from the nearest land wells, so that only small producers have been obtained. It is believed that a mile offshore will be sufficient to insure large gas production under heavy pressure. The water at this point is between 30 and 40 ft. deep, and substantial piers will be required to withstand seasonal storms and ice floes in the spring. It is expected work will be started as soon as formal approval is secured from the Dominion Public Works Department.

Prince Edward Island. — Another underwater drilling venture is contemplated by a group headed by Hugh J. MacKay of Sapulpa, Okla., which has secured a license to prospect and drill for natural gas and oil in the province of Prince Edward Island. Earlier in the winter, under the direction of Robert Griesbach, engineer of the Foundation Co. of Montreal, and Eldon Hicks of the Inspiration Mining & Development Co. of Amos, Que., a series of three structure tests was drilled through the ice on Hillsboro Bay to determine the most favorable location for an underwater test. A fourth test was prevented by the breakup of the ice, the drill, gasoline engine and other equipment being carried out on an ice floe and recovered only when the tide turned and the ice drifted back. Location of the work was about 1½ miles southwest of Governor's Island, where a deep test was drilled some years ago.

Mackenzie. — Contract has been let by interests associated with Imperial Oil to the Eastman Oilwell Service of Turner Valley for the drilling of directional test under the Mackenzie River in the Fort Norman area. Equipment and personnel are being taken north by plane. The producing horizon is around 1,200 ft. and the most favorable structure is several hundred feet from the nearest point on land for initial surface drilling, so that a quite sharp deviation from vertical will be required. If the initial test is successful, further directional drilling may be undertaken in this area.

Alberta Research Council.—The Research Council of Alberta at Edmonton has outlined a five-point program of work for 1943, in which three items concern the oil industry. The council is planning extensive geological survey work in northwestern Alberta, studies of outstanding problems in bituminous sand separation and bitumen utilization, and further investigations into the commercial utilization of natural gas.

Tax Concessions for Gas Drilling.—Hon. J. L. Isley, federal minister of finance, has announced that tax concessions in the new Dominion budget designed to encourage oil drilling will be definitely extended to drilling for natural gas. On wells which start drilling between January 1, 1943, and March 31, 1945, natural-gas operators will be allowed to accumulate expenditure on dry holes as an offset against income from producing wells subsequently found, in computing income tax; and they will also be allowed to write off labor costs as a current expense in the case of productive wells.

Turner Valley. — Forthcoming production figures for Turner Valley are likely to be stepped up by three new completions aggregating 2,396 bbl. daily initial production. The most important of these is Northwest-Hudson's Bay 12, LSD 8, 8-18-2w5, in the southwest extension of the field, finished at 7,764 ft. with Madison limestone at 7,242 ft. This well produced after acidization around 70 bbl. an hour, or at the rate of 1,680 bbl. daily,

(Continued on Page 95)

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Drilling Contractors

J. R. Sharp, Tulsa, who has drilled most of the wells in Lubbock County, Texas, is now drilling below 4,200 ft. on his 1 Martin, 10 miles southwest of Lubbock. He is completing a nice well in the Weiner pool of Winkler County, Texas, at his 2 Halley and will move one location west for No. 1.

C. C. Gilger, Longview, Tex., finished his 4 Cass County in the Kildare pool of Cass County, Texas, for 132 bbl. per day from total depth of 6,200 ft., and has two other locations staked in the same pool.

S. B. Roberts, Abilene, Tex., is starting a partnership spudder test in Taylor County, Texas, north of the View pool, to go to 2,500 ft.

Arrow Drilling Co., Tulsa, has started a 1,600-ft. test on a Shell farmout on the east side of the Taylor-Link pool of Pecos County, Texas. Arrow is down to 3,000 ft. on a wildcat for Bryce McCandless in Section 20, Block 26, University Survey, contracted to 6,000 ft.

Cross Drilling Co., Odessa, Tex., finished Belfort Oil Co. 1-W University, Section 14, Block 16, University Survey, in Ward County, Texas, last week. It went to 3,110 ft. and was dry.

Housh & Thompson, Houston, Tex., have been awarded contract for Edward R. Hudson 1 Weiss, 8,500-ft. wildcat in Hardin County, Texas.

Mac Drilling Co., Houston, Tex., is rigging up for 2 Gips, a semiwildcat in the Nordheim area of De Witt County, Texas, to be drilled for Tide Water Associated Oil Co. The location is ½ mile from production. Contract depth is 8,500 ft. Mac has a string of tools working on 1 Cinco ranch, in Fort Bend County, for the Stanolind Oil & Gas Co.

Oil Production Maintenance, Inc., Houston, Tex., has started a workover of A-5 Maco Stewart, in the Dickinson field, Galveston County, Texas, for Humble Oil & Refining Co.

Glenn H. McCarthy, Houston, Tex., was getting ready to spud 1 Hebert Trust, a wildcat test which he will drill for his own account in the William Sigler Survey, 4 miles southwest of Viterbo, Jefferson County, Texas. Mr. McCarthy is also drilling two wells for himself in the Winnie area of Jefferson County, one of them an offset to his 1 Hankamer-McLean, which was a pool opener.

Houston Drilling Corp., Houston, Tex., has spudded in Salt Dome Corp. 1 Peters, in the Mayo field, Jackson County, Texas. It is expected to go to about 5,500 ft.

Golding-Farris Drilling Co., Houston, Tex., has the contract for a semiwildcat to be drilled ½ mile north of the Lotz sand production in the Turtle Bay field, Chambers County, Texas, for Guy Lombardo, the orchestra leader; R. J. Ursillo, his manager; D. M. Wallace, Houston independent oil operator, and John J. Eisner, New York. The well is the 1 Tassie Lotz and R. M. White unit, in the Jamison Survey.

Southern Drilling & Well Service Co., Houston, Tex., will drill a wildcat for Phillips Petroleum Co. on the north flank of the Blue Ridge dome, in Fort Bend County, Texas. It is the 1 Robison-Bashara. Projected depth is 7,000 ft.

Baldridge & King, McAllen, Tex., contractors, have staked location for 1 Mary Headley Edgerton, a wildcat test in Jose Antonio de la Garza Falcon Porcion, Starr County, Texas,

PIPE WIPERS

PATTERSON BALLAGH
CORPORATION
Los Angeles Houston New York City

which they will drill for their own account. It is a Texas Co. farmout.

Grey Wolf Drilling Co., Houston, Tex., has contracted to drill a well for Shell Oil Co., Inc., on the McFadden lease in the Clam Lake field of Jefferson County, Texas. Contract depth is 7,000 ft.

Franklin Drilling Co. has the contract for a deep wildcat test in Garvin County, Oklahoma, 8 miles southeast of the Pauls Valley pool. It is Ohio Oil Co. 1 Garvin, SE NE SW 17-3n-2e.

Sam Jewell, of Ada, Okla., was drilling below 2,000 ft. at R. H. Lynn et al 1 Yonts, in SW SW SW 8-15n-4e, northwest of Chandler in Lincoln County, Oklahoma. Contract depth is 4,000 ft.

B. & C. Well Servicing Co., Houston, Tex., is moving in material to workover the 2 Julie H. Casey for Humble Oil & Refining Co. in the South Cotton Lake field, Chambers County, Texas.

Blackstock Brothers, of Shreveport, La., have contract for a Wilcox test for Northern Ordnance, Inc. The well will be 1 General American Life in NE NE 9-7n-7e, Concordia Parish, Louisiana, about 7 miles north and east of the Willow Lake pool.

Danciger Oil & Refining Co. has contract for a Wilcox test, Carter Oil Co. 2 Grace Rhodes, in the NW NW 28-9n-10e, Tensas Parish, Louisiana, southwest of the new Lake St. John pool.

Butler & Horne Drilling Co., Dallas, Tex., are down to 2,000 ft. on a wildcat southeast of the Wimberly pool in Taylor County, Texas. Contract is to 2,500 ft.

R. C. Lipscomb, San Antonio, Tex., is drilling a second well on the same lease as his discovery from the Strawn sand in northeastern Montague County, Texas, near Illinois Bend.

J. C. Arthurs, Inc., Mount Pleasant, Mich., is the contractor on Freeman Oil Co. 1 Corning, C NE SE 22-25n-4w, Crawford County, Michigan.

Fisher-McCall Oil & Gas Co., Mount Pleasant, Mich., has contracted to drill J. W. Kuhns 1 Frank E. Richardson, C NW SE 1-3s-3w, Jackson County, Michigan.

Will I. Lewis, Mount Vernon, Ill., contractor, has tools engaged on five operations, four in Illinois and one in Kentucky. Derrick is being moved in for Falcon-Seaboard Drilling Co. 1 Mead, SE NW 23-5s-6e; drilling is progressing below 2,000 ft. on Oil Management, Inc., 1 U. S. Coal & Coke, NE NW NW 25-5s-2e, Hamilton County, Illinois; tools are being moved to Robinson & Puckett Oil Co. 1 Polk Realty Trust, NW NW 25-16s-1w, Pulaski County, Illinois; Robinson & Puckett 1 Clark, Section 21, Ballard County, Kentucky, is drilling around 3,000 ft., looking for the St. Peter, and Lario Oil & Gas Co. 1 Puckett, NW NW SE 36-6s-4e, Franklin County, Illinois, is a new operation.

Gordon Oil Co., Mount Pleasant, Mich., has moved his rotary rig from Smith Petroleum Co. 1 Plummer in the Fork field of Mecosta County, Michigan, to location for the same operator's 1 Ralph, S½ SW NW Section 8.

Ashby Drilling Co., Mount Pleasant, Mich., is the contracting firm on C. L. Maguire, Inc., A-1 State, C S½ NE NE 34-18n-9w, Osceola County, Michigan.

J. W. Tripplehorn, Fort Worth, Tex., has two locations in the old Deep Rock area of Andrews County, Texas, that he will drill to 4,500 ft. This is the first producing area in Andrews County, discovered in 1929.

J. F. Postelle, Odessa, Tex., is moving in for a 3,000-ft. wildcat for Ohio Oil Co. in western Tom Green County, Texas, after finishing an 8,486-ft. contract for same company in Sterling County, Texas.

Peck & Croft and **Likins & Hall**, Midland, Tex., contractors, have one well drilling and another location on a partnership lease in the Keystone-Colby sand pool of Winkler County, Texas, and are starting another on a Shell farmout in the World pool of Crockett County.

Coastal Drilling Co., Houston, Tex., is drilling 2 Rodesney, in the Mayo field, Jackson County, Texas, for Louis Crouch. Projected depth is 5,700 ft. Coastal will drill for its own account 1 W. W. McCrory, in the West Mauritz field, Jackson County.

John E. Bish Well Servicing Co., Houston, Tex., has started a workover job for Shell Oil Co., Inc., on 3 Heyd, in Evangeline Parish, Louisiana.

C. I. Drilling Corp., Houston, Tex., will drill 2 Samuel Haas estate, in the Pine Prairie field, Evangeline Parish, Louisiana, for C. I. Production Co., Inc. and Kirby Petroleum Co. It is planned to go to the Sparta, at about 9,000 ft.

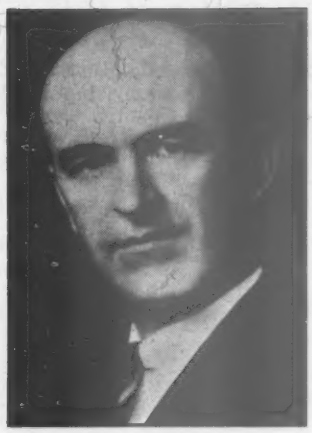
Morris-Hamilton Drilling Co., Houston, Tex., is at work on G-7 Gray, in the Vinton field, 33-10s-12w, Calcasieu Parish, Louisiana, for Union Oil Co. of California. Projected depth is 6,000 ft.

Franklin & Tidemann, Ltd., Houston, Tex., are building road for a well to be drilled for Yegua Oil Corp., the 1 J. Elmer Boyt, in Liberty County, Texas. This is a wildcat test, to go to 7,500 ft., 6 miles southeast of Devers.

Lon H. Cron, Houston, Tex., has received two drilling contracts from Continental Oil Co. One is for 1 S. G Henderson, in the Citrus Grove area of Matagorda County, Texas. The other is for B-14 R. Driscoll, in the Driscoll field, Duval County, Texas.

One of Loffland Brothers' drilling crews in the Embar pool, Andrews County, Texas. The men are O. K. Hostetter, driller; U. G. Chisholm, motorman; D. A. Davidson, pipe racker; and Dennis Steward, backup man

PERSONALS



CHASE E. SUTTON

Sutton's New War Job Offers Outlet for Long Experience

CHASE E. SUTTON, Houston, Tex., recently appointed chairman of the oil industry's District 3 production subcommittee on joint use of facilities, is general manager of Pure Oil Co.'s Gulf Coast producing division and vice president and general manager of Orinoco Oil Co., a Pure subsidiary, whose operations are in Maracaibo, Venezuela.

Mr. Sutton's first oil job was that of instrument man in the civil engineering department of Union Oil Co. of California. He was a naval engineer in World War I and at its close he became field engineer for Interstate Oil Co., Los Angeles, Calif. Obtaining leave of absence from August 1, 1919, to March 1, 1920, he served as inspector and petroleum engineer for the California State Mining Bureau at Taft. Returning to Interstate, he was made production engineer in charge of field operations, acquiring a thorough knowledge of development and production work in the Signal Hill, Elk Hills, Midway, Montebello, Sunset, and Huntington Beach fields. He continued with the company until 1926, when he joined the U. S. Bureau of Mines in Dallas, Tex., as petroleum engineer.

While with the Bureau of Mines, Mr. Sutton prepared reports on the Powell, Wortham, and other Texas fields. Also he prepared a report on geophysical prospecting for petroleum. Mr. Sutton began his service with Pure Oil Co. June 1, 1928, as production engineer in El Dorado, Ark., during the Champagnolle boom. He was transferred to Tulsa 6 months later as division production engineer, and in September 1929 he was assigned to Houston as manager of the Gulf Coast district. Upon organization of the Gulf Coast producing division in 1932, Mr. Sutton was made general manager.

Mr. Sutton was born in Helena, Mont., in 1897. The family moved to Los Angeles and the boy attended the public schools and Polytechnic High School there. He graduated from the University of California in Berkeley. He is a member of the Braeburn Country Club, Houston, and enjoys a game of golf when there is time.

P. H. Curry, chairman of South Penn Oil Co., Pittsburgh, Pa., last week resigned from that position and retired from the board. **Otis O. Cole,** chief engineer and geologist, succeeds Mr. Curry as a director. For 8 years previous to April 1942 Mr. Curry was president of South Penn. He entered employ of Standard Oil Co. at Oil City, Pa., in 1890. Mr. Cole has been with South Penn since 1911. He has been stationed in Pittsburgh since 1917.

H. L. Scott, geologist and land man of the old Independent Oil & Gas Co., is now associated with Northern Ordnance, Inc., and is now busy arranging to drill several wildcat test wells.

H. C. Smith has been appointed farm boss in the Bluford, Ill., district for Lario Oil & Gas Co. **Clark Snider** has been added to the geological staff in the same district and **Lee Conroe** and **Glad Tydings** have joined Lario's land department as scouts and field men in Illinois.

Ralph T. Zook, of Bradford, Pa., of the firm of Sloan & Zook, has graduated from an Army orientation course at Command and General Staff School, Fort Leavenworth, Kansas.

W. A. McLean, commissioner of public utilities in Alexandria, La., was kept busy recently explaining to natural-gas customers the cause of a terrific odor that filled their homes. A month's supply of evil-smelling mercaptans, used to reveal gas-line leaks, had been injected into the Alexandria-Ville Platte line in 24 hours by mistake.

Joseph P. Gudger, traffic manager of the Gulf companies, Houston, Tex., has been named chairman of a Chamber of Commerce committee charged with arranging the program for Pan American Week in Houston. The week's events are designed to promote good will among peoples of the Western Hemisphere. Students from Latin-American countries attending Texas A. & M. College will attend luncheons in native costumes.

F. E. HOLSTEN

Frank E. Holsten, New Orleans, La., executive vice president of Chalmette Refining Co., is the new president of the Gulf Coast Refiners Association, succeeding **D. W. Hovey.** Mr. Holsten represents the association in the PIWC. Before joining Chalmette he was vice president of Barnsdall Refining Co., Cosden & Co., and Pierce Oil Corp., in Tulsa.

M. G. Kidd, formerly district geologist at San Antonio, Tex., for Stanolind Oil & Gas Co., has been transferred to Houston, Tex., and promoted to division geologist. **H. E. Menger,** San Antonio, has been promoted to district geologist at that office, succeeding Mr. Kidd.

Frank M. Racher, who has spent the past 6 years drilling in Trinidad, Venezuela and Brazil, has returned from the latter country to Petrolia, Ont., to recuperate after a serious illness. He made the trip from Brazil to Florida by plane.

Ralph I. Meyers, gager in the Burbank, Oklahoma, field for Empire Pipe Line Co., has resigned to accept a position with the War Emergency Pipelines, Inc., as assistant oil dispatcher at Longview, Tex.

John G. Morgan, accountant for Frank and George Frankel, oil producers, Houston, Tex., until he entered Red Cross work last fall, has arrived safely in North Africa, along with 45 others, according to word received by the American Red Cross. Before he joined the Frankel organization, Mr. Morgan was with Houston Lighting & Power Co.

George J. Gaenslen, Southwest Texas geologist for Amerada Petroleum Corp., with his office in Hous-

ton, has been transferred to the company's West Texas district office in Midland. **James S. Kirkendall,** who was West Texas geologist, Midland, has been transferred to Houston, the two men exchanging posts.

J. A. Blood, Standard Oil Co. of California, is the new chairman of the executive committee of the Asphalt Institute which represents most of the major petroleum asphalt producers of the United States and Canada. Asphalt tonnage in 1942, despite curtailment of manufacturing and shipping, declined only 2 per cent from the record-high level of 1941.

Robert M. Bacher, who was associated with the engineering department of Humble Oil & Refining Co., at Houston, Tex., and now a lieutenant colonel in the Army, is commanding officer of the Pantex Ordnance plant, in Houston.

H. H. Wiggins, previously stationed at El Dorado, Kans., has been transferred to the Chase, Kans., district and promoted to the position of head roustabout for Cities Service Oil Co., in that division.

Elmer Long, formerly employed in District 1, Oklahoma City, Okla., producing operations by Cities Service Oil Co., has been transferred to the Seminole area and promoted to head roustabout, replacing **G. L. Goodwin,** who is now in military service.

Gordon W. Reed last week was reelected president, **Lawrence S. Reed** vice president and general manager, **Val T. Billups** vice president, and **William H. Hendrickson** secretary-treasurer, of Texas Gulf Producing Co., Houston, Tex. These four, with **Clarendon E. Streeter, Thomas S. Taliaferro,** and **Roland L. O'Brien,** constitute the directors. Mr. Billups is a new member of the board. **John M. Carter,** chief accountant, was elected assistant secretary-treasurer.

Shifts: **Paul T. Jacobs,** engineer, Continental Oil Co., Ville Platte, La., to Electra, Tex.; **E. W. Drake,** engineer, Sun Oil Co., Beaumont, Tex., to Thebodoux, La.; **V. E. Childs,** engineer, Texas Co., Tahoka to Haskell, Tex.; **J. E. Blackman,** geologist, Gulf Research & Development Co., Elk City, Okla., to Kingman, Kans.; **Ernest Allen, Jr.,** engineer, Phillips Petroleum Co., Phillips, Tex., to Kaw, Okla.; **E. M. Funkhouser,** geologist, Woodley Petroleum Co., Houston to Midland, Tex.; **L. K. Laney,** engineer, Texas Co., Houston, Tex., to New Orleans, La.; **G. E. McClatchey,** engineer, Barnsdall Oil Co., Texarkana, Ark., to Bowie, Tex.; **Sidney C. Patterson,** engineer, Kansas-Nebraska Natural Gas Co., Phillipsburg, Kans., to Oklahoma City, Okla., and **George N. Roberts,** engineer, Shell Oil Co., Inc., McPherson, Kans., to Bristow, Okla.

Paul D. Bushong, executive secretary of the Kentucky Oil and Gas Association, has resigned effective April 1, to accept a position with Standard Oil Co. of Ohio. He will be located in the company's new office at Shreveport, La., and will be working under **Earl D. Wallace,** former president of the association. Mr. Bushong has been succeeded by **J. C. Preston,** of Owensboro, Ky.

J. Elmer Thomas, oil man and geologist of Fort Worth, Tex., who has been serving with the Petroleum Administration for War as special assistant to Deputy Administrator Ralph K. Davies for the past 2 years, has indicated his intention to resign soon to return to private business.

Paul William Neely, of Oil City, Pa., formerly employed by National Transit Pipe Line Co., has been graduated from the Army Air Forces advanced flying school, Napier Field, Dothan, Ala., and given a commission as second lieutenant.

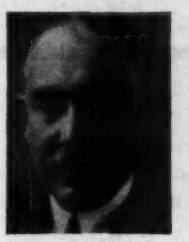
M. H. Champion, former traffic manager for Anderson-Prichard Refining Corp., Oklahoma City, Okla., has been appointed a captain in the Army, and assigned to transportation work. He has gone to Camp Hathaway, at Vancouver, Wash.

Herbert A. Yocom, assistant director of the Division of Public Relations of the Petroleum Administration for War, became the father of a 7½-lb. daughter, Judith Ann, March 17. Mr. and Mrs. Yocom are also the parents of two sons.

W. B. Moran, president of J. E. Crosbie, Inc., Tulsa, has announced that he is creating a new department, the land, exploratory and geological department, and that **H. L. Moore** has been named manager of the division. Mr. Moore has been division geologist for Oklahoma and Kansas of Atlantic Refining Co. since 1936.

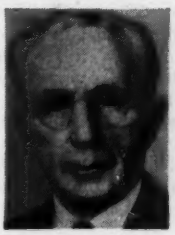
J. S. Leach, vice president of Texas Co., Houston, Tex., has been named chairman of the marketing committee for District 3. He succeeds **Roy B. Jones,** of Wichita Falls, Tex., president of Panhandle Refining Co.

Paul L. McGee, petroleum engineer for Humble Oil & Refining Co., in the Galveston Bay district, Galveston County, Texas, has been transferred to the Conroe district, Montgomery County, He is succeeded at Galveston Bay by **Louis F. Bonner,** transferred from the Goose Creek district, Harris County. **John L. Sinclair,** chief clerk in the Arcada district, Galveston County, is transferred to the Wieland district, Hunt County.



W. L. MELLON

W. L. Mellon, chairman of Gulf Oil Corp.'s directors; **Herman Taylor,** superintendent of the company's Fort Worth, Tex., refinery, and **C. M. Hilliard,** manager of the fuel and gas-oil department, Jacksonville, Fla., will receive 40-year service emblems during the first half of this month. Awards will be made at the various offices,



HERMAN TAYLOR

C. M. HILLIARD

refineries and laboratories of the company to employes who have completed 30, 25, 20, 15 and 10 years of service with Gulf. Altogether this year 2,352 employes of the company in 32 states will receive service awards.

Paul E. Fitzgerald, with Dowell Incorporated, Tulsa, addressed a joint meeting of the Fort Worth Geological Society and the Petroleum Engineers Club at Fort Worth, Tex., Monday, March 22, on "Selective Acidizing and Permeability Determination by an Electrical Method."

R. B. Mitchell, formerly Panhandle (Tex.) district geologist for Stanolind Oil & Gas Co., has resigned his position with the company at Houston, Tex., and has accepted a position with the consulting engineering firm of Foran, Boatright & Dixon, of Houston.

C. F. Succop, president of the American Roller Bearing Co., Pittsburgh, Pa., recently had just cause for pride in the accomplishments of his son, **Lt. Lawrence Succop,** manager for the company in the Texas-Louisiana-Oklahoma area with headquarters in Houston, Tex., until he enlisted in the Army Air Forces 2 years ago. Lieutenant Succop participated in the air battle over Wau field, New Guinea, in which American P-40 Kittyhawk pilots shot down 26 Jap bombers and fighters for sure and possibly accounted for at least 15 more.

Market Developments

Gulf Coast

HOUSTON, Tex.—Although uneasiness continues among many Gulf Coast refiners over the recent communication of Ralph K. Davies, deputy petroleum administrator, declaring substantial improvement of transportation conditions was unlikely till next year and calling for voluntary cessation of refinery operations that do not contribute to the war effort, the gasoline market this week was described as increasingly satisfactory. A few soft spots exist. These are cases of refiners who had overheavy inventories when the Petroleum Administration ordered discontinuance of tank-car shipments of gasoline from this territory to the East Coast. Some of the refiners thus caught have found no way to get rid of their excess supplies.

A majority of the refiners apparently have found some means of solving with a fair measure of success the problems created by the war. Rising agricultural demand for tractor fuel continued this week to be a potent factor in steadying the gasoline market. The U. S. Motor grade is the one chiefly called for, affording a helping hand to the small refiner who is not equipped to make the aviation grades required by the Army and Navy.

Kerosene is so scarce that marketers declare they do not dare accept orders for more than an occasional car. No. 2 heating oil was reported to be even tighter than last week.

Mid-Continent

CALL for gasoline from agricultural sections of the Middle West marketing territory is the current feature of Mid-Continent refinery operations. Some parts of the agricultural section are heading into record consumption of motor fuel, partly as a result of expanded planting operations and partly from a continuing trend to the use of more volatile fuels in farm tractors.

Distributors report that demand from civilian automobile drivers is fairly static and that the only deviation from routine consumption is at war-industry centers.

Mid-Continent refiners currently appear to be in close balance between production and demand for essential civilian motor fuel. Stocks are considerably lower at most plants than at the same season in former years. There is substantial interrefinery buying, although a majority of plants are in position to meet shipping instructions from regular customers from their current production and working stocks.

Demand continues brisk for distillate fuel oils. Most Mid-Continent refiners are short on kerosene and tractor fuel. Residual fuel oil is moving without resistance. Railroads and large manufacturers are anxious to obtain larger supplies. At the current rate of operations, most Mid-Continent plants are unable to accept additional business for heavy fuels, particularly under their existing inability to secure additional crude connections.

East Coast

NEW YORK. — Distress conditions which last week affected kerosene principally centered on gasoline since then. Gasoline difficulties were attributed to the belated cashing of coupons before the ration period for which they were good ended early last week. Motorists were apparently anxious to fill their tanks to the fullest extent possible in view of the doubling of the length of the succeeding period which, in effect, reduced the value of coupons by half.

This resulted in such a heavy drain on gasoline stocks that a number of stations were reported to have been forced to close due to lack of supplies. This condition was regarded as purely temporary and is expected to be remedied in a short time since the reduced demand in the current period will require considerably smaller quantities of motor fuel. However, it is also probable that some of the stations that have closed and others will be forced out of business by the further reduction in sales. A number of marginal stations, including some operated by major companies, have closed recently.

Additional concern has been reported over heavy fuel-oil supplies. In spite of the conversion program, demand remains high and stocks have continued to decline. Normally residual-fuel-oil demand is supplied to a large extent through imports which are said to be less than one-third of normal at present. Under the circumstances, no appreciable easing of this problem is expected before the end of the war with the prospect that more serious difficulties will be encountered.

Another drop in the A.P.I. index, the third in succession which brought it down to a new low, indicates that supplies available for civilian consumption are now less than three-tenths of normal.

A.P.I. REFINERY REPORT

Week Ended March 20, 1943

(Figures in thousands of barrels)

	Dly. crude runs to stills	Stocks: Gasoline	Stocks: Residual	Stocks: Gas oil
Appalachian	147	2,721	488	807
Ind., Ill., Ky.	702	21,059	2,598	3,484
Okla., Kan., Mo.	349	7,298	1,374	1,665
Censored area*	1,643	40,268	9,929	14,544
Rockies	91	2,090	554	356
California	686	20,723	53,235	10,888
Total 3-20-43	3,618	94,159	68,178	31,724
Total 3-13-43	3,579	94,161	68,243	32,629
Total 3-21-42	3,579	107,926	83,394	31,337

Note: Refinery runs and stocks for week ended March 27, 1943, appear on Trends page, unless unavoidably delayed.

*Reports combined on East Coast, Texas Gulf, Louisiana-Arkansas and Inland Texas at request of PAW.

CRUDE-OIL STOCKS

(Bureau of Mines Estimate)

Week ended:	Bbl. of crude*
March 20, 1943	238,417,000
March 13, 1943	236,655,000
March 21, 1942	261,724,000

*Excludes unrefinable California stocks.

Pacific Coast

LOS ANGELES, Calif. — February gasoline sales in California were down approximately 26 per cent from a year ago and this just about sums up conditions in the California marketing picture. The local picture is without special interest and has been stagnant for so long that almost anything would prove attractive. Current indications point to the probability that the market will roll along at present levels for some time as there is not enough volume moving to seriously affect prices. Later in the year some improvement may be effected as a result of deliveries to the Defense Plant Corp.'s butadiene plant now under construction as this will remove some volume of gasoline or light ends from the commercial field. By decreasing the amount of gasoline that must find an outlet in the commercial field, independent refiners might find it possible to step up the lowest price.

There has been a marked trend in recent weeks to take over shutdown stations in favorable areas by a group that will soon be in a position to take large deliveries which always command a better price. Twenty-one stations have already been included in the chain and, as might be expected, the posted price is the lowest possible.

Refinery Prices

(Prices as of March 30)

Quotations are f.o.b. plant in cars and in cents per gallon except where otherwise noted. They are exclusive of the federal excise taxes of 1.5 cents a gallon on gasoline and 4.5 cents a gallon on lubricating oils, and do not include marine lighterage charges.

REFINERY GASOLINE

Octane (A.S.T.M.):	†80	74-76	72-74	68-70	63-66
Mid-Continent*	.....	.....	5.875-6.000	.....	5.500-5.625
Pennsylvania	.....	6.750-7.000	.....	.....	.....
Gulf Coast‡	6.00-6.50	.....	§5.750-6.250	§5.750-6.250	§5.250-5.750
Northeast Coast	9.80	.....	9.2	9.2	.....
California	.....	6.125-6.500	6.000-6.125	5.500-6.000	5.000-5.250

*Basis Group 3. †1939 C.F.R. (research method). ‡Integrated companies restricted to lowest prices. §Unleaded.

KEROSENE AND NO. 1 FUEL OIL

Gravity:	46	45	42-44	41-43	38-40
Mid-Continent*	.....	.....	4.500	4.375	.....
North Louisiana	.....	.....	.....	4.500-4.750	.....
Pennsylvania	6.250-6.625	6.125-6.250	.....	.....	.....
California	.....	.....	.....	4.500-5.500	4.250
Northeast Coast	.....	.....	.....	6.80	.....
Gulf Coast	.....	.....	.....	3.875	.....

*Basis Oklahoma Group 3.

TRACTOR, DIESEL, AND BUNKER FUEL OIL

Specifications:	46-48° G.	48-52 D.I.	48-52 D.I.	58 & above	Diesel bunkers	Residual Bunker C‡
Mid-Continent*	4.125	.....	.....	.....	.....	$0.80-1.27
California	.....	2.750-4.000	.....	.....	†1.35-1.45	0.85-1.00
Gulf Coast	.....	.....	4.000	4.125	1.45	0.85-1.27
Northeast Coast	.....	.....	.....	6.800	2.780	1.65-2.07
North Louisiana	.....	.....	.....	.....	.....	0.80-1.27

*Basis Oklahoma Group 3. †10-14° gravity. ‡Pacific Specification 200. §Gravity range.

FURNACE OIL, GAS OIL, FUEL OIL

	No. 2	No. 3	No. 5	No. 6
Mid-Continent*	3.625-3.750	3.500-3.625	$0.85	$0.80
Pennsylvania (West)	5.875-6.125	5.875-6.000	†5.250-5.500	.....
Northeast Coast	6.7	6.7	1.95	1.65
Pacific Coast	5.5	5.5	‡0.80-95	§0.80
Gulf Coast	3.875-4.0	.....	1.65	0.85

*Basis Oklahoma Group 3. †36-40 gravity fuel. ‡Pacific Specification 300. §Pacific Specification 400.

NATURAL GASOLINE

Grades:	26-70	18-55
Oklahoma (Group 3)	3.875	4.650
North Texas	3.500	4.200
North Louisiana	3.625	4.350
California	4.875	5.500

LUBRICATING OILS

Bright and Steam Refined

OKLAHOMA (Group 3)—		
200-210 D, 10-25		27.00
150-160 D, 0-10		23.00
120-125 D, 0-10		22.00
Stea refined:		
600 dark green (untreated)	9.00	9.50
PENNSYLVANIA—		
Bright Stocks (Pennsylvania Grade No. 8 color, 140-150 at 210, 545-550 flash)		
10 pour point		30.50
15 pour point		29.50
25 pour point	25.00	28.00
Steam refined:		
600	15.00	16.00
650	15.50	16.50
600 flash	16.00	17.50
630 flash	17.00	17.50

Neutral Oil

(Vis. at 100° F. except Pennsylvania and color N.G.A.)

OKLAHOMA (Group 3)—	
0-10 pour point:	
200-3	15.00
300-3	18.00
500-3	19.50
600-3	20.00

Note: Viscous neutrals, 10-25 pour, quoted 0.5 cent under 0-10 oils.

Neutral Oils

CALIFORNIA—		
Pale Oils:		
200-2½-3	7.00	7.75
400-3-4	7.25	8.00
600-3-4	8.75	11.00
Red oils:		
200-4-5	7.00	7.75
400-5-6	9.00	11.00
500-900, 5-6½	9.25	11.25
GULF COAST—		
Pale oils:		
200-3	8.50	8.75
300-3	9.00	9.25
500-3½	9.75	10.00
750-3½	10.00	10.25
2,000-4	10.50	10.75
3,000-4	12.25	12.50

PENNSYLVANIA—	
150 vis. at 70° F., 3 color, 400-405 flash:	
Zero pour point	37.50
10 pour point	36.50
15 pour point	35.50
25 pour point	30.00
200 vis. at 70° F., 3 color:	
Zero pour point	39.50
10 pour point	38.50
15 pour point	37.50
25 pour point	32.00

WAX

(Cents per pound)

OKLAHOMA (Group 3)—	
124-126 (A.m.p.) w.c. scale	4.250
PENNSYLVANIA (inland refineries)—	
122-124 (A.m.p.) w.c. scale	4.250
124-126 (A.m.p.) w.c. scale	4.250
NEW YORK—	
Wax in bags fully refined:	
130-132 (A.m.p.) wax	5.850
133-135 (A.m.p.) wax	6.150
Crude scale:	
124-126 (A.m.p.) w.s.	4.250
124-126 (A.m.p.) y.s.	4.250

TANK-WAGON PRICES IN 50 CITIES

(Gasoline prices based on regular grades, tax included, undivided dealer)

ATLANTIC AND NEW ENGLAND

(Socony-Vacuum Oil Co., Inc., and Atlantic Refining Co.)

	Dealer tank wagon	Combined tax	Kero tank wag
Baltimore, Md.	15.95	5.50	10.20
Boston, Mass.	14.90	4.50	9.80
Burlington, Vt	16.90	5.50	10.10
Buffalo, N. Y.	16.20	5.50	10.60
Dover, Del	16.70	5.50	12.00
Hartford, Conn.	15.60	4.50	9.70
Manchester, N. H.	17.30	5.50	10.80
Newark, N. J.	15.20	4.50	9.70
New York, N. Y.	16.10	5.50	9.80
Philadelphia, Pa.	16.20	5.50	11.65
Pittsburgh, Pa.	16.70	5.50	12.00
Portland, Me.	16.30	5.50	9.90
Providence, R. I.	15.00	4.50	9.60
Washington, D. C.	15.20	4.50	11.00
Average 14 cities (All prices undivided dealer basis.)	16.02	5.14	10.49

CENTRAL

(Standard Oil Co. of Indiana, Standard Oil Co. of Ohio, Continental Oil Co., and Texas Co)

	Dealer tank wagon	Combined tax	Kero tank wag
Chicago, Ill.	13.40	4.50	10.30
Cleveland, Ohio	15.00	5.50	*9.00
Dallas, Tex.	13.00	5.50	7.00
Des Moines, Iowa	14.40	4.50	9.80
Detroit, Mich	14.40	4.50	9.60
Fargo, N. D.	16.90	5.50	11.30
Huron, S. D.	16.30	5.50	10.70
Indianapolis, Ind	15.20	5.50	9.80
Little Rock, Ark.	17.50	8.00	10.00
Milwaukee, Wis.	16.10	5.50	10.50
Minneapolis, Minn.	15.40	5.50	10.30
Omaha, Neb.	15.40	6.50	9.80
Tulsa, Okla.	16.50	7.00	8.50
Wichita, Kans.	12.70	4.50	8.00
Average 14 cities	15.15	5.57	9.61

*Includes 1-cent state tax.

SOUTHEASTERN

(Standard Oil Companies of New Jersey, Kentucky, and Louisiana)

	Dealer tank wagon	Combined tax	Kero tank wag
Atlanta, Ga.	18.90	7.50	*11.50
Birmingham, Ala.	18.50	8.50	9.00
Charleston, S. C.	18.95	7.50	
Charleston, W. Va.	19.25	6.50	13.30
Charlotte, N. C.	20.10	7.50	11.30
Jacksonville, Fla	18.90	8.50	9.50
Jackson, Miss.	17.50	7.50	†9.00
Louisville, Ky.	16.50	6.50	8.50
Memphis, Tenn.	17.90	8.50	10.50
New Orleans, La.	17.75	8.50	*10.00
Norfolk, Va.	17.45	6.50	12.00
Average 11 cities	18.34	7.50	10.46

*Includes 1-cent state tax.
†Includes ½-cent state tax.

MIDWESTERN

(Continental Oil Co.)

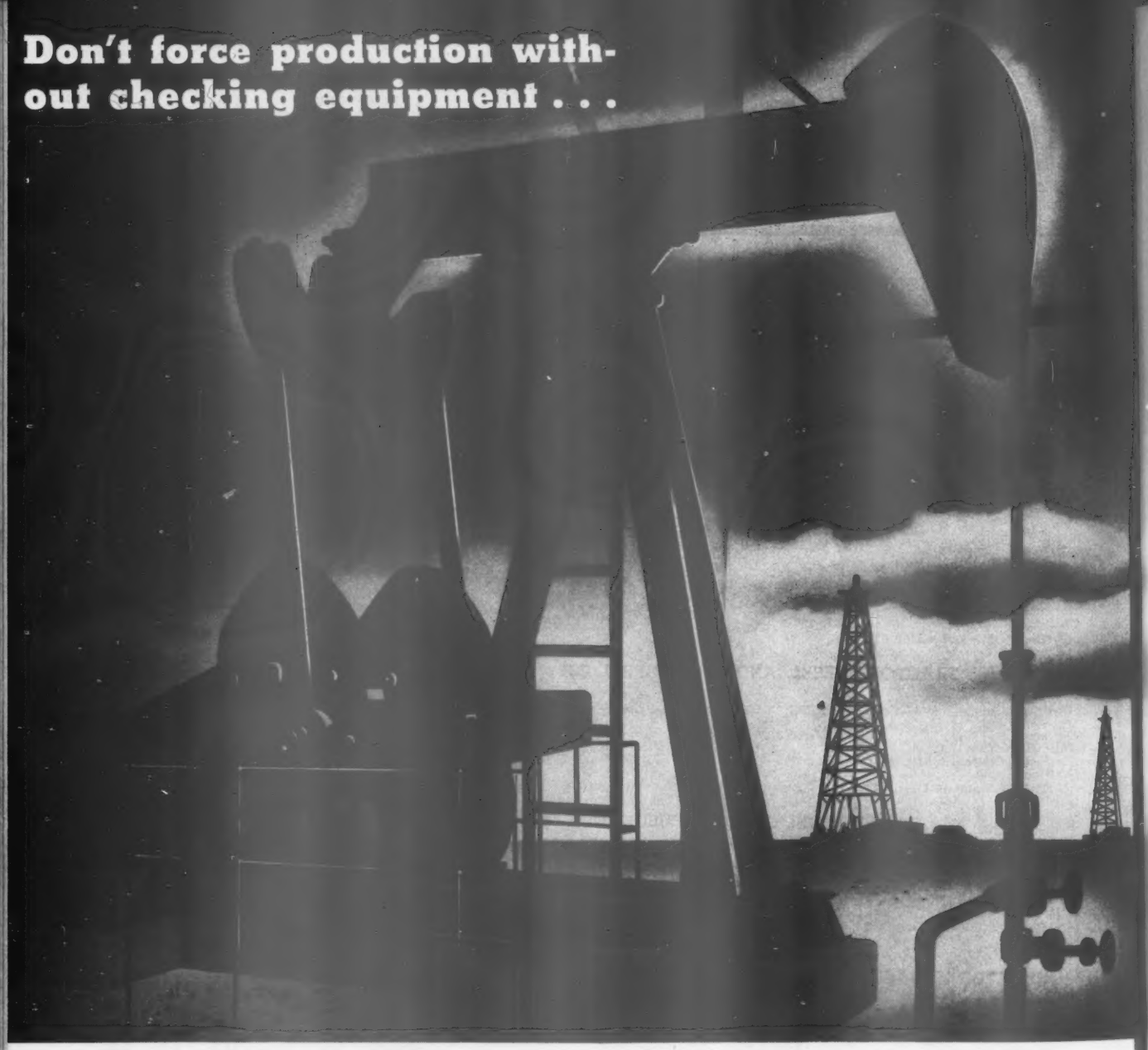
	Dealer tank wagon	Combined tax	Kero tank wag
Albuquerque, N. M.	17.50	7.50	10.00
Boise, Idaho	20.10	6.50	16.50
Casper, Wyo.	17.00	5.50	12.00
Denver, Colo.	14.50	5.50	11.00
Helena, Mont.	17.00	6.50	13.00
Phoenix, Ariz.	18.50	6.50	12.50
Reno, Nev.	17.50	5.50	13.50
Salt Lake, Utah	18.50	6.50	14.50
Average 8 cities	17.58	6.25	12.88

PACIFIC COAST

(Standard Oil Co. of California)

	Dealer tank wagon	Combined tax	Kero tank wag
Portland, Ore.	17.00	6.50	13.50
San Francisco, Calif.	14.50	4.50	11.50
Seattle, Wash.	17.00	6.50	13.50
Average 3 cities	16.17	5.83	12.83
Average 50 cities	16.55	5.96	10.76

Don't force production without checking equipment . . .



Information supplied by "Oil and Gas Journal"

Today the question of obtaining maximum possible production from pumping wells has gone beyond the simple economics of extra production value versus increased lifting costs. The risk of damage to equipment that can be replaced only with difficulty is the primary consideration.

The practical seriousness of the question can be shown by an actual example. Production in a field that has been restricted to 90% capacity was suddenly stepped up to 100% capacity. In a single day 20% of the wells went down with crank, rod and other equipment failures.

In this case, the risk was certainly not justified by possible increase in production.

Maximum production can be obtained with greater safety if the following factors are taken into account first: (1) Careful selection of surface equipment, pumps and rods; (2) Determination of correct pumping speed and stroke with regard to the fluid level in the hole and the type of pump and surface equipment used; (3) Careful balancing of the pumping equipment to minimize shocks.

CLIMAX FURNISHES AUTHORITATIVE ENGINEERING DATA ON MOLYBDENUM APPLICATIONS.
MOLYBDIC OXIDE—BRIQUETTED OR CANNED • FERROMOLYBDENUM • "CALCIUM MOLYBDATE"

Climax Molybdenum Company
500 Fifth Ave. • New York City

MOLY

Equipment Progress

New Proportioning Pump for Latex

A new large-size Adjust-O-Feeder proportioning pump for handling regular and off-grade latex, as well as many other viscous fluids, has just been announced by % Proportioneers, Inc. %, Providence, R. I.

This new design includes the following features: (1) Special double stuffing gland containing metallic stripper rings for keeping viscous material out of the packing, (2) large easily removable inspection ports with hand clamps for ready inspection of the 3½-in. diameter ball check valves without the use of special tools, (3) fluid sealing of displacement plunger and stuffing gland as well as provision for water washing of the plunger as it moves through the stuffing box.

The drive motor and speed reducer are separate units, permitting the individual removal of either in the event that repair or reconditioning is necessary. The moving parts of the pump are fully enclosed, presenting a pleasing appearance as well as providing complete safety for the operator.

Latex Proportioneers are available in simplex and duplex construction and in sizes up to and including 30 g.p.m. at 40 r.p.m.

Cameron Iron Works Purchases Abercrombie Pump Co.

According to an announcement by E. L. Lorehn, vice president and general manager of Cameron Iron Works, Houston, Tex., the Abercrombie Pump Co. has been purchased outright by the Cameron company.

Abercrombie Pump Co. is well known throughout the oil industry, having manufactured fluid-piston slush pumps, mud-line pressure gages, shear-relief valves and several other products for the oil industry for many years.

All of the products heretofore manufactured by Abercrombie Pump Co. will now be manufactured and marketed by Cameron Iron Works.

Trade Literature

Brown-Strauss Corp., Kansas City, Mo.—A complete catalog, listing reconditioned equipment and material which the company has on stock for immediate delivery to oil refineries and industrial plants. Complete inventory of recently acquired refineries is included. Catalog will be furnished on request.

Sonken-Galamba Supply Co., Tulsa. Refining catalog and inventory of complete stocks carried. Included in the inventory is the listing of complete refineries offered for sale at Kilgore, Tex., and Stark, Mich. Listed also are numerous valves, fittings, towers, vessels, pumps and other equipment carried in stock. The company deals principally in reconditioned and used refining equipment. Catalog will be furnished on request.

Nonmetallic Drain and Sewer Pipe

Development of a new line of nonmetallic drain and sewer pipe, requiring no critical war materials, to replace dwindling supplies of metal pipe has been announced by H. J. Robertson, Jr., president, Fibre Conduit Co., Orangeburg, N. Y.

The new nonmetallic pipe is said to be resistant to moisture, tuberculation, root growth, corrosion and most dilute inorganic acids and alkalies. It is durable, light—can be installed easily and cut to desired lengths with an ordinary wood-working saw. Couplings maintain pipe lengths in line and provide tight joints if desired.

"Oil companies in Texas, Oklahoma and other fields have installed over a million feet of this pipe in connection with salt-water disposal," Mr. Robertson said.

The pipe is manufactured in perforated and nonperforated form.

Among Equipment Men

Walton at Tulsa for Clark Brothers Co.

George W. (Jack) Walton has been named to head the new division for Clark Brothers Co., Inc. Mr. Walton comes to the Clark organization with a background of more than 20 years of successful sales and engineering experience. He will make his headquarters in Tulsa.

Henninger Made Lieutenant

Fred Henninger, vice president, McNamar Boiler & Tank Co., Tulsa, has received a commission as lieutenant in the U. S. Naval Reserve. He is now stationed at Jacksonville, Fla., aviation division U. S. Naval Air Base.

Frick-Reid Entertains

Frick-Reid Supply Corp., Tulsa, held a dance and bridge at the Tulsa Club on the evening of March 20 for employes of its Tulsa office.

Personnel of Frick-Reid's home office has grown so rapidly during the last few months that this company party was held as an informal get-together and get-acquainted affair. Approximately 400 were in attendance. Pres. J. L. Shakely made the statement of welcome, and A. G. Chamberlain acted as master-of-ceremonies during the floor show. Dancing and bridge comprised the remainder of the entertainment. A midnight breakfast was served.

Pocsik Refining Sales Manager of McAlear Mfg.

Steve Pocsik has been appointed manager of refinery sales for McAlear Mfg. Co., 1901 S. Western Ave., Chicago, Ill., manufacturers of valves and controls.

Mr. Pocsik recently was associated with the Phillips Petroleum Co. as instrument design engineer. In this capacity he was responsible for the instrument design on the first HF alkylation unit which was designed and built by Phillips.

Mr. Pocsik has had 13 years experience in refinery instrumentation and control application problems, being formerly associated with Gulf Refining Co., and McAlear Mfg. Co.

California

(Continued from Page 79)

the present opposition will be removed. This expression, in view of Shell's effort in the Salt Lake field, should be forthcoming in the near future.

LOS ANGELES BASIN COMPLETIONS

(Reported week ended March 20)

Huntington Beach wildcat district; Orange County: Richfield Oil Corp. 1 Weirick, 7-6s-10w, abandoned in gray sand, T.D. 2,158 ft., no important showings.

Huntington Beach, Orange County: Signal Oil & Gas Co. 34 Bolsa, 33-5s-11w, flowed 168 bbl., 26.4-gravity, 1 per cent cut, 30,000 cu. ft. gas, pressures 60/550 lb., T.D., 3,814 ft., perf. 3,540-3.813 ft., completed in lower Bolsa zone, Pilocene.

Standard Oil Co. 42-A Huntington Beach, 3-6s-11w, pumped 165 bbl., 18.2-gravity, 1.1 per cent cut, T.D. 3,600 ft. P.B. 3,-485 ft., gravel packed perf. 3,181-3,341 ft. 3,373-3,483 ft., completed in lower Bolsa zone, Pliocene.

Wilmington, Los Angeles County: Long Beach Oil Development Co. 48-W Harbor, 10-5s-13w, flowed 208 bbl., 16.1-gravity, 0.6 per cent cut, T.D. 3,640 ft., gravel packed perf. 3,244-3,515 ft., 3,545-3,635 ft., completed in Ranger zone, Pilocene.

Yorba Linda, Orange County: Shell Oil Co. 57-16 Olinda fee 4, 16-3s-9w, pumped 49 bbl. net, 15.8-gravity, 80 per cent cut, T.D. 2,540 ft., perf. 2,302-2,537 ft., completed in Olinda zone, Miocene.

COASTAL DISTRICT

Ventura County.—General Petroleum Corp. received a pleasant surprise in the Ventura Avenue field a week or so ago when 4-A Barnard, an old pumping well, suddenly broke loose and began flowing 550 bbl. of 27.9-gravity oil per day. This surprising well is only 4,734 ft. deep and the zone at this point has been in a depleted condition for several years. No. 4-A Barnard which replaced 4 Barnard is at present flowing about 450 bbl. daily. The latter well was lost as a result of a blowout a number of years ago but recently the old crater has been showing signs of life and is being watched with special care to prevent any blow. It is quite possible that by producing 4-A Barnard the pressure will be reduced sufficiently to relieve the pressure on the old crater. Present production which is coming through a 32/64-in. bean behind pressure of 190/200 lb. is cutting 20 per cent but may clean up somewhat after the well has been on production for some additional time.

Del Valle field.—Herley & Kelley have finally succeeded in completing 1 Handy in the west end of the field pumping 225 bbl. daily from the Videgain zone at 5,973 ft. During the recent rains a landslide covered this well and it was necessary to employ a steam shovel to dig out. Mechanical conditions in the well are not all that might be desired and the well has required considerable attention Standard Oil Co. is starting a new well on the Sepulveda property in the San Martinez end of the field and up in the Aliso Canyon field Tide Water Associated Oil Co. has spudded in a second well on the Standard-Sesnon property. Several months ago, Tide Water Associated Oil Co. completed a joint well with Standard on the Sesnon property and proved up the existence of substantial production in a new deep zone. In addition to proving up this new deep zone the company extended the limits of the Aliso Canyon field about ½ mile to the west. This new Sesnon zone of Miocene age, based on the results of drilling looks like a major discovery and the present well should throw some additional light on the horizon within the next 3 months.

COASTAL DISTRICT COMPLETIONS

Santa Maria Valley, Santa Barbara County: Union Oil Co. 5 Battles, 25-10n-34w, flowed 350 bbl., 16.7-gravity, 35 per cent cut, T.D. 4,230 ft., 180 mesh perf. 2,668-2,955 ft., 2,992-3,271 ft., 3,383-3,642 ft., completed in Monterey of Miocene age.

(Reported week ended March 20)

Arroyo Grande wildcat district, Santa Barbara County: Los Mietos Co. 1 Holmes, 6-32s-13e, abandoned in hard brown shale, T.D. 3,935 ft., top Miocene 2,100 ft., top chert zone, 2,400 ft., no important showings of oil or gas logged.

Newhall wildcat district, Los Angeles County: Southern California Petroleum Corp. 44-1 La Salle, 3-3n-16w, abandoned as dry hole, no important oil or gas showings logged, T.D. 6,067 ft., top Miocene 5,165 ft.

San Fernando wildcat district, Los Angeles County: J. P. Getty 1 Foothill Orchards, 6-2n-15w, abandoned, T.D. 3,559 ft., all cores taken showed gray sand, steep dips from 2,100 ft. on down, vertical dips on bottom of hole.

Ventura Avenue, Ventura County: Shell Oil Co. 158 Taylor, 19-3n-23w, flowed 2,752 bbl., 31.7-gravity, 0.1 per cent cut, 1,-750,000 cu. ft. gas, 128/64-in. bean, pressures 250/850 lb., T.D. 9,425 ft., perf. 7,790-7,939 ft., 7,980-8,485 ft., 8,565-8,946 ft., 8,986-9,422 ft., completed in intermediate Lloyd zone, Pliocene.

Louisiana Gulf Coast

(Continued from Page 74)

T.D. 9,149 ft., perf. 8,982-92 ft. and 9,015-27 ft., 175 bbl. through 14/64-in. choke, T.P. 475 lb., gas-oil ratio 1,000, perf. 8,906-18 ft., 75 bbl through ¼-in. choke, C.P. 100 lb., gas-oil ratio 1,000.

(Reported week ended March 20)

Fields

Anse la Butte, St. Martin Parish: George Echols et al 1 St. Germain, 114-9s-5e. dry at 10,383 ft.

Bayou Blue, Iberville Parish: Union Sulpher Co., Inc. 7 Schwing Lmber & Shingle Co., 67-9s-11e, dry at 7,102 ft.

Bayou des Allemands, St. Charles Parish: Stanolind 3 St. Charles Land Co., 282 bbl. through 5/32-in. choke, T.P. 1,350 lb., gas-oil ratio 957, perf. 9,964-70 ft., T.D. 10,205 ft.

Jennings, Acadia Parish: Stanolind 118 Crowley Oil & Mineral Co., 48-9s-2w, O.W.W.O., old T.D. 7,595 ft., new T.D. 7,575 ft., perf. 7,550-70 ft, 312 bbl. pumping.

La Fourche Crossing, La Fourche Parish: Mikton Oil Co. 4 Martinez, 132-15s-17e, O.W.W.O., old T.D. 10, 181 ft., pulled tubing and squeezed off perf., P.B. 8,-737 ft., perf. 8,660-80 ft., 162 bbl. distillate through 14/64-in. choke, T.P. 2,550 lb., C.P. 2,625 lb., gas-oil ratio 16,586, new sand for this field.

Leeville, La Fourche Parish: Texas 88 L. L. E.-Leeville, 34-21s-22e, 135 bbl. through ⅛-in. choke, T.P. 1,140 lb., gas-oil ratio 1,740, perf. 8,006-56 ft., T.D 8,500 ft.

Paradis, St. Charles Parish: Texas Sunset Realty & Planting Co., 38-14s-20e, 244 bbl. through 9/64-in. choke, T.P. 1,600 lb., gas-oil ratio 753, perf. 10,190-224 ft., T.D. 10,425 ft.

Pine Prairie, Evangeline Parish: C. & I. Production Co. et al 1 Sam Haas estate, 2-4s-1w, O.W.W.O., old T.D. 9,146 ft., pulled tubing and acidized, 174 bbl through 14/64-in. choke, T.P. 400 lb., gas-oil ratio 1,000 lb., perf. 8,982-92 ft and 9,015-27 ft.

Starks, Calcasieu Parish: W. T. Burton 8 Lutcher Moore Lumber Co., 30-9s-12w. dry at 3,557 ft.

West Hackberry Cameron Parish: Stanolind 65 State Lease-Black Lake, 17-12s-10w; dual completion, from perf. 9,234-48 ft. 456 bbl. through ⅞-in. choke, C.P. 1,080 lb., gas-oil ratio 373; from perf. 9,636-754 ft. 660 bbl. through ¼-in. choke, T.P. 820 lb., gas-oil ratio 480; T.D. 9,800 ft.

Permian Basin, Panhandle

(Continued from Page 67)

drilled 660 ft. from south and east lines 3-16s-33e, on acreage contributed by Phillips Petroleum Co. Location falls about 10 miles northwest of the Vacuum pool, and test will be carried to 5,100 ft.

SOUTHEAST NEW MEXICO

Wildcats

Eddy County: Broderick et al 1 State, NE NE 8-17s-29e, S.S.O. 1,675-90 ft., dry, T.D. 2,500 ft.

Quay County: Stanolind Oil & Gas 1 J. W. Fuller, 25-8n-30e, dry, T.D. 6,747 ft., granite.

Jackson-Grayburg, Eddy County: Western Production 5-C Keely, SW SE 24-17s-29e, flow 157 bbl., pay 2,964 ft., T.D. 2,975 ft.

McMillan, Eddy County: Heacock & Owens 1 Yates, SW NE NE 6-20s-27e, dry, T.D. 987 ft.

Russell, Eddy County: Dr. George Turner 3-X Neil Wills, NW SE 13-20s-28e, pump 25 bbl., pay 842 ft., shot 30 qt., T.D. 869 ft.

(Reported week ended March 20)

Fields

East Lusk, Lea County: Carper Drlg. Co. et al 1 Miller, SE NE, 23-19s-32e, dry T.D. 2,710 ft.

Grayburg-Jackson, Eddy County: Nash, Windfohr & Brown 6-B Jackson, NW NW, 25-17s-30e, flow 840 bbl., pay 3,201-3,260 ft., shot 150 qt., T.D. 3,260 ft.

R. R. Woolley 3-A Arnold, SE NE, 26-17s-30e, flow 108 bbl., pay 3,198 ft., shot 135 qt. 3,198-3,250 ft., T.D. 3,280 ft.

Red Lake, Eddy County: F. R. Hadlock 2 State, 1,990 ft. from N, 330 ft. from W. 36-17s-27e, pump 6 bbl. oil, 14 bbl. water, pay 435 ft., acid 1,000 gal., P.B. to 457 ft from T.D. 531 ft.

PANHANDLE COMPLETIONS

Carson County: Hagy-Harrington & Marsh 1-A F. E. Witter, 1,820 ft. from E, 2,640 ft. from S Sec. 1, Blk. 7, I.&G.N. Ry. Sur., elev. 3,298 ft., I.P. 46,000,000 cu. ft. gas, pay 2,468 ft., lime and dolomite, T.D. 2,660 ft.

Hutchinson County: J. M. Huber Corp. 5 State of Texas, 1,350 ft. from W, 575 ft. from N Sec. 78, Blk. 46, H.&T.C. Ry. Sur., elev. 2,802 ft., I.P. 75 bbl., pay 2,710 ft., T.D. 2,711 ft.

Shamrock Oil & Gas Co. 5 Stewart, 1,980 ft. from S and E of lease, Sec. 19, Blk. M-16, A.B.&M. Sur., elev. 3,334 ft., I.P. 283 bbl., pay 3,150 ft., T.D. 3,200 ft.

(Reported week ended March 20)

Gray County: Sinclair Prairie Oil 2 R. W. Harrah, Sec. 163, Blk. 3, pump 24 bbl., pay 3,161 ft., T.D. 3,260 ft.

Hutchinson County: Continental Oil 9-C J. M. Sanford, 1,037 ft. from S, 660 ft. from W of N½ Sec. 79, Blk. 46, H.&T.C. Sur., elev. 2,835 ft., showings at 2,694 ft., 2,796-98 ft., dry, T.D. 2,903 ft.

Classified Advertising

EQUIPMENT FOR SALE

FOR SALE — One complete steam rotary outfit less boilers, located near Coyle, Oklahoma, priced to sell. Inquire T. T. Eason and Company, Enid, Okla.

WAR

WHAT IT TAKES TO WIN

MANPOWER AND EQUIPMENT

The following critical materials being offered for sale and immediate delivery:

18 STEEL BUILDINGS, CONSISTING OF 250,000 SQ. FT. OF AREA, LOCATED AT
EGYPT, PA.
EASTON, PA.
NORTHAMPTON, PA.
NEW CASTLE, DEL.

MANY EQUIPPED WITH CRANE RUNWAYS FOR HEAVY DUTY

37 LARGE OIL STORAGE TANKS UP TO 35,000 BARREL CAPACITY, LOCATED IN NORTHERN OHIO.

Are in Position to Dismantle, Match-Mark and Load Buildings or Tanks

3200 TONS OF STRUCTURAL STEEL, MISC. LENGTHS. PRIME CONDITION, AVAILABLE FOR IMMEDIATE DELIVERY. LOCATED IN CENTRAL OHIO.

HAVE AVAILABLE IN PHILADELPHIA, PA., 1500 TONS OF STRUCTURAL STEEL, ALL SIZES AND SHAPES, INCLUDING TRUSSES AND GIRDERS.

For Information and Immediate Action

PHONE, WRITE or WIRE

PLANT & EQUIPMENT PURCHASING CO.
Fountain Square Bldg., Cincinnati, Ohio
Phone Main 2142
or
BUYERS SERVICE & ENGINEERING CO.
P.O. Box 552, West Tulsa, Oklahoma
Phone 2-4441

FOR SALE:

300—13" OD, 8 thread, new casing couplings

1—Gasoline Power Drilling Rig good for 3000'.

Also Steam Drilling Rigs and pipe and casing of all sizes.

We also purchase abandoned Leases, Refineries, pipe lines and other oil field equipment.

If in need of material or have material for sale, communicate with

Louisiana Iron & Supply Co.
Shreveport Louisiana
Phone 5223 or L.D. 1

EQUIPMENT FOR SALE

FOR SALE: Lufkin pumping unit suitable for 4000' well. Melton Supply Co., Seminole, Okla.

FOR SALE—Bessemer Gas Engines, Compressors and repair parts. Vessels, towers, pumps, Chaplin Fulton regulators, Fisher liquid level controls, vacuum, pressure & temperature recorders, meters, valves, fittings, pipe and other miscellaneous material. GILBERT PIPE & SUPPLY, Electra, Texas.

500 tons of cable tools at a big saving. You can pick what you want.

DEEGEN PIPE & SUPPLY CO.
401 No. Boston
Phone 3-2329 Res. 6-4726
Tulsa, Okla.

ROYALTIES

WE BUY & SELL all types of Oil and Gas Royalties. Sales restricted to registered dealers only. Grimes Royalty Co., National Mutual Bldg., Tulsa, Okla.

PATENT ATTORNEYS

PATENTS, Trade-Marks. Booklet, "General Information Concerning Inventions and Patents" and "Free Schedule" sent without obligation. Established 1915. Lancaster, Allwine & Rommel, Suite 418, Bowen Bldg., Washington, D. C.

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CAPITAL SEEKERS—Interested in raising $25,000 or more for a legitimate project should write to AMSTER LEONARD, Fox Theater Bldg., Detroit, Mich.

SALES LETTERS THAT INVESTORS ANSWER. Prospectus prepared. Created by Expert. Mailing lists. Stockholders, Moneyed Individuals, Lease Buyers, etc. Delaware Charters Secured. Suggestions FREE FAULTLESS ORGANIZATION, 3439 Michigan, Chicago.

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THE BURKHART LINE of Legal Blanks Since 1908. Oil-Gas and Business Forms for Mid-Cont. and Illinois Basin. Leases Rev. with Gov.'s Regulations. Catalog and Samples. Burkhart Ptg. & Sta. Co., 115 So. Cincinnati, Tulsa, Okla.

REAL ESTATE

WINNFIELD, LA.

Center of North Central Louisiana oil activity, invites oil men and oil concerns to make their homes and headquarters at Winnfield.

TOWN OF WINNFIELD
City Hall Winnfield, La.

Canadian Fields

(Continued from Page 83)

making it one of the largest wells in the field, and first allowable will be around 600 bbl. The other new producers are in the north end of the field. In the north extension Northwest-Hudson's Bay 10, LSD 11, 8-21-3w5, finished at 8,711 ft. with Madison at 8,240 ft. In North Turner Valley, Foothills Oil & Gas 14, LSD 6, 27-20-3w5, finished at 7,726 ft. with Madison limestone at 6,954 ft. Initial production of these wells is around 300 to 400 bbl. each.

Southwest extension. — Completion of Northwest-Hudson's Bay 12, LSD 8, 8-18-2w5, as a large producer has attracted attention to the possible further southwest extension of the Turner Valley field. Since faulting was encountered in 9-18-2w5 some years ago, the south end has been neglected, except for operations of the Northwest Co. on Hudson's Bay acreage in 8-18-2w5, farther to the west. Systematic development has resulted in the completion of a succession of producers of which the most recent completions, Northwest-Hudson's Bay 8 and 12, have both been exceptional producers. No. 12, on the eastern edge of the section, got the Madison limestone comparatively hgih at 7,242 ft. and drilled 522 ft. into the lime to get an initial production estimated around 1,680 bbl. daily. Imperial-Hudson's Bay 15 is rigging in LSD 1, 8-18-2w5, south of No. 12 and east of No. 8.

North extension. — Bonaventure Royalties 1, LSD 16, 24-21-4w5, most northerly active test, has encountered considerable shows of crude oil in the Dalhousie sand, above the Madison limestone. The test got the Kootenay formation around 9,030 ft. and is deepening below 9,474 ft. It will be carried to 10,000 ft. unless the Madison limestone is encountered higher. The Dalhousie formation proved about 200 ft. thick, and arrangements are being made for a production test of this horizon. Shortly before the first Madison limestone production was discovered in 1924, Dalhousie No. 5 encountered light crude in fair commercial quantities in what has since been known as the Dalhousie sand, and still has a small production from this horizon.

Crude-Oil Prices

Representative selected crude prices from all sections of the country appear below:

East Texas	$1.25
Conroe	1.43
Tepetate, Louisiana	1.18
Illinois basin	1.37
Pecos County, Texas	.95
Bradford, Pennsylvania	3.00
Van, Van Zandt County, Texas*	1.03

*No change since 5-21-41.

Gravity Schedules

Top prices include all gravities above grades designated, and low prices include all gravities below grades designated:

Gravity—	Signal Hill, Calif.	Oklahoma, Kansas	Gulf Coast Texas	West Texas*
18-18.9	$0.80	...	...	
19-19.9	.84	...	$1.06	$0.70
20-20.9	.88	$0.85	1.08	.72
21-21.9	.92	.87	1.10	.74
22-22.9	.96	.89	1.12	.76
23-23.9	1.00	.91	1.14	.78
24-24.9	1.03	.93	1.16	.80
25-25.9	1.07	.95	1.18	.82
26-26.9	1.11	.97	1.20	.84
27-27.9	1.15	.99	1.22	.86
28-28.9	1.18	1.01	1.24	.88
29-29.9	1.20	1.03	1.26	.90
30-30.9	1.23	1.05	1.28	.92
31-31.9	...	1.07	1.30	.94
32-32.9	...	1.09	1.32	.96
33-33.9	...	1.11	1.34	.98
34-34.9	...	1.13	1.36	1.00
35-35.9	...	1.15	1.38	1.02
36-36.9	...	1.17	1.40	1.04
37-37.9	...	1.19	1.42	1.06
38-38.9	...	1.21	1.44	1.08
39-39.9	...	1.23	1.46	1.10
40 and above	...	1.25	1.48	1.12

*Includes Lea County, New Mexico.

Journalisms:

NEXT week the American Association of Petroleum Geologists will hold its wartime conference at Fort Worth, Tex., together with the Society of Exploration Geophysicists and the Society of Economic Paleontologists and Mineralogists. The meeting is devoted almost exclusively to an appraisal of the nation's present and prospective reserve situation and will have an even wider appeal than usual. Papers of general interest will be presented by prominent geologists, oil company executives and government officials and these will be published in next week's issue of The Journal.

PRESIDENTIAL addresses are occasionally more noted for their eloquence than for the meat which they contain but war conditions place emphasis on definite information and programs. Fritz Aurin and Frank Goldstone, leaders of the geologists and geophysicists, respectively, present accurate appraisals of the current exploration picture and make concrete suggestions for its improvement. They both point out that the successes of the exploration groups have been great but that the future requires greater initiative, more freedom of action and more courageous recommendations than in the past.

FREDERIC H. LAHEE presents his annual review of wildcat activity and appraises the degree of success which it attained last year while L. F. McCollum, recently transferred from the presidency of Carter Oil Co. to New York reviews the record of exploration in the central part of the country and points out what geologists must be prepared and permitted to do to reverse the declining discovery trend.

AS chairman of the research committee, A. I. Levorsen has been most active and energetic and has visited practically every geological group in the United States. He has compiled the results of his own investigations together with the views of a large number of geologists into a paper called Discovery Thinking which will be presented in next week's issue.

IN the Engineering and Operating Section of next week's Journal, G. E. Anderson of Foster Wheeler Corp. discusses the problem of expanding refinery facilities in the face of shortages of equipment. His paper deals primarily with the more effective use of existing equipment in increasing steam capacity.

ONE of the great dangers in repressuring depleted oil reservoirs with air-gas mixtures is that they may explode in the compressors and lines when present in certain proportions. Next week, Frederick Squires of the Illinois State Geological Survey describes a safety cylinder which is used for the detection of explosive mixtures and presents methods of preventing costly and dangerous accidents.

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CALENDAR

April

INTERSTATE OIL COMPACT COMMISSION, quarterly meeting. Wichita, Kans., April 2-3.

AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS, annual meeting, Texas Hotel, Fort Worth. Tex., April 7-9.

AMERICAN PETROLEUM INSTITUTE, Division of Production, Eastern district, William Penn Hotel, Pittsburgh, Pa., April 8-9, 1943.

AMERICAN CHEMICAL SOCIETY 105th annual meeting, Detroit, Mich., April 12-16.

NATURAL GASOLINE ASSOCIATION OF AMERICA, twenty-second annual meeting, Baker Hotel, Dallas, Tex., April 14-16.

NATIONAL PETROLEUM ASSOCIATION, semiannual meeting, Cleveland Hotel, Cleveland, Ohio, April 15-16.

NATURAL GAS MANAGEMENT CONFERENCE, under auspices of Natural Gas Section, American Gas Association, Gibson Hotel, Cincinnati, Ohio, April 28.

AMERICAN PETROLEUM INSTITUTE, DIVISION OF PRODUCTION, Southwestern District, Rice Hotel. Houston, Tex., April 29-30.

May

PETROLEUM INDUSTRY ELECTRICAL ASSOCIATION, annual meeting, Houston, Tex., May 5-6, 1943.

AMERICAN INSTITUTE OF MINING AND METALLURGICAL ENGINEERS, Petroleum Division, Baker Hotel, Dallas, Tex., May 6-8.

INDEPENDENT PETROLEUM ASSOCIATION OF AMERICA, midyear meeting, Jefferson Hotel, St. Louis, Mo., May 7-8.

NATIONAL FIRE PROTECTIVE ASSOCIATION, Palmer House, Chicago, Ill., May 10-15.

AMERICAN PETROLEUM INSTITUTE, spring meeting, Division of Production, Mid-Continent district, Mayo Hotel, Tulsa, May 20-21.

JOINT PRODUCTION AND CHEMICAL COMMITTEE CONFERENCE, sponsored by Technical Section of American Gas Association, Hotel Pennsylvania, New York, May 24-25.